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Bibliography on Ozone (1858–1953)

May 1959 No. 5

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 10 MAY 1959 No. 5

SPECIAL FEATURE IN THIS ISSUE

Bibliography on Ozone (1858–1953)

By

Mary L. Rice and Geza Thuronyi

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field.

Part I contains abstracts of current literature in the fields of meteorology, etc.

Part II of each issue comprises an annotated bibliography of important references on a special subject (usually arranged chronologically).

Bibliographies published in the successive issues were:

Vol. I, 1950

1. Atmos. Pollution 2. Aerobiology 3. Cloud Physics 4. Hail
5. Tornadoes 6. Volcanic Dust 7. Climat. Changes 8. Thunderstorms
9. Icing 10. Acoust. Propagation 11. Evaporation

Vol. II, 1951

1. Extended Forecast. 2. Long Range Forecast. 3. Soil Temp. 4. Constants, etc.
5. Clim. of Near East 6. Clim. of Middle East 7. Special Winds 8. Radar Storm
9. Condensation Trails 10. Clim. of N. E. Africa 11. Mountain Met. Detect.

Vol. III, 1952

1. Clim. of N. W. Africa 2. Carbon Dioxide 3. Clim. of Argentina, etc. 4. Dew
5. Objective Forecast. 6. Stratus Forecast. 7. Urban Climatology 8. Clim. of C. Africa
9. Visibility 10. Glaze and Rime 11. Free Air Turbulence

Vol. IV, 1953

1. Turbulence Theory 2. Turbulent Diffusion 3. Frost 4. Clim. of Australia, etc.
5. High Level Winds 6. Winds in Stratosphere 7. Jet Stream 8. Radiation Bioclim.
9. Clim. of Pacific 10. Auroras 11. Sferics

Vol. V. 1954

1. Oceanog. Met. 2. Clim. of S. E. Asia 3. Auroral Physics 4. Tropopause
5. Balloons 6. Numerical Forecast. 7. Radiation Data 8. Vertical Motion
9. Clim. of Arctic 10. Industrial Met. 11. Wind Waves and Swell

Vol. VI, 1955

1. Bibliog. of Bibliog. 2. Texts & Monogr. Bibliogs. 3. Storm Surges
4. Ionospheric Prop. 5. Photochem.—Upper Atmos. 6. Cloud Physics
7. Radar Cloud Physics 8–9. Atmos. Nuclei 10. Weather Modification 11. Cooling Power

Vol. VII, 1956

1. Synoptic Met.-Arctic 2. Clim. of Enclosed Spaces 3. Cosmic Rays (–1952)
4. Cosmic Rays (1953–56) 5. Atmos. Radioactivity 6. Inversions
7. Snow Micromet. 8. Snow Micromet. (Suppl.) 9–11. Tropical Cyclones

Vol. VIII, 1957

1. Solar Weather Relations 2. Night Airglow 3. Forecasting Special Elements
4. Forest Micrometeorology 5. Hydromet. Forecasting 6. Numerical Forecast. (Suppl.)
7. Albedo 8. Meteors 9–10. Tropospheric Prop. 11. Medical Meteorology

Vol. IX, 1958

1. Radioastronomy 2. Solar Astrophysics 3. Radioactivity in Atmosphere
4. Waves and Currents 5. Physical Oceanog. 6. Dynamic & Phys. Oceanog.
7. Long Range Forecast. 8. Radar Met. 9. Cosmic Rays 10–11. Geomagnetism

Vol. X, 1959

1. Works of C. E. P. Brooks 2. Tornado forecasting 3. Soil Moisture 4. Sferics
5–6. Ozone

Other bibliographies in preparation are:

Actinometers *High Atmosphere Temperatures* *Singularities*
Evaporation *Micrometeorology* *Synoptic Aerology*
Frost *Radiation* *Thunderstorms*

Part III contains a listing of reviews, translations, reprints, and the contents of important publications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue comprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

COLLECTED WORKS

10.5–1 523.7:08

Colloque International d'Astrophysique, 7th, Liège, July 12–14, 1956, **Les molécules dans les astres.** [Molecules in the heavenly bodies. Proceedings of the 7th International Symposium of Astrophysics, Liège, July 1956.] *Société Royale des Sciences de Liège, Mémoires*, Ser. 4, 18(1), **1957.** 571 p. figs., tables, refs., eqs. **DWB, DLC**—This memoir contains the various communications presented at the 7th International Symposium of Astrophysics, which met at Liège on July 12, 13 and 14, 1956. Introduction written by P. SWINGS, (Inst. of Astrophysics, Univ. of Liège). This work contains 66 articles arranged in 4 sections, which are: 1) Molecules in the solar system. 2) Molecules in the stars (sun included); observations. 3) Molecules in the stars (theory). 4) Recent experimental investigations about the molecules presenting an astronomical interest. An introductory report precedes each section; it reviews the latest progress made in that field and summarizes the various communications which are presented on the subject of the section. Summaries, joining together the arguments relative to several communications, are presented in the proper places in the volume. (For listing of contents, *see* Pt. III, p. 1561, Nov. 1957, *MAB.*) *Subject Heading:* **1. Astrophysics conferences.**—*A. V.*

10.5–2 523.7:08

Colloque International d'Astrophysique, 8th, Liège, **[1957?], [Proceedings].** *Société Royale des Sciences de Liège, Mémoires*, Ser. 4, 20(1), **1957.** 518 p. figs., tables, refs. **DLC**—This memoir contains the various papers presented at the 8th International Symposium of Astrophysics at Liège. Introduction by P. SWINGS (Univ. of Liège) and O. STRUVE (Univ. of California). This work contains 57 articles arranged in 6 sections: 1) Warm stars with emission lines. 2) Medium-temperature stars with emission lines. 3) Cold stars with emission lines. 4) Peculiarly abnormal stars. 5) Relation between various classes of variable stars with emission lines. 6) Recent experimental and theoretical investigations about the permitted and forbidden lines or bands which present an interest for the stars with emission lines. An introductory report precedes each section; it recalls the last progress realized in that field and summarizes the various accounts which are presented on the subject of the section. *Subject Heading:* **1. Astrophysics conferences.**—*A. V.*

10.5–3 551.509.317

American Meteorological Society. District of Columbia Branch, **Proceedings of the Workshop on Stratospheric Analysis and Forecasting, Wash., D. C., Feb. 1–3, 1956.** Wash., D. C., Dec. **1956.** 168 p. figs., tables, refs. throughout. **DWB**—The purpose of the Workshop was to "impart to the participants the latest knowledge and known technique of stratospheric forecasting and analysis" and "to point out to the profession in general deficiencies in our knowledge." The lectures delivered are as follows: Todd, W., **Rawin set AN/GMD-1A,** p. 3–19; Rossing, A. T., **Aircraft reconnaissance as a means of obtaining observations in the lower stratosphere with emphasis on future developments,** p. 20–23; Mastenbrook, H. J., **The transosonde—a new system of meteorological data,** p. 24–36; Ellsaesser, H. W., **Errors in upper-level wind forecasts,** p. 37–43; Kochanski, A. B., **Structure and analysis of the lower stratosphere,** p. 44–57; Moreland, W. B., **The 100-mb and 50-mb map project—analysis problems and some 50-mb circulation features,** p. 58–77; Machta, L., **Vertical diffusion in the**

stratosphere, p. 78–83; Kellogg, W. W., **Very high level observations,** p. 84–97; Hering, W. S and Mount, W. D., **Specification of 200-mb and 100-mb contour heights by vertical extra polation of lower-level data,** p. 98–116; Johannessen, K. R., **Three-dimensional analysis of th jet stream through shear charts,** p. 117–128; Wobus, H. B., **Wind and pressure gradien computation with applications to trajectory computations,** p. 129–143; Austin, J. M., **50-m patterns and their relationship to tropospheric changes** (Abstract), p. 144–145; Panofsky H. A., **Flow patterns at 100 mb and above,** p. 146–155; Árnason, G., **Some considerations fo numerical prediction in the stratosphere, with results of 24-hour barotropic forecasts for 10 mb,** p. 156–164; **Laboratory problem and instructions: Three-dimensional analysis of th jet stream layer utilizing shear charts,** p. 165–168. *Subject Headings:* **1. Upper air analysi 2. Prognostic upper air chart preparation.**

10.5–4 551.506:551.579.1:551.573(791,793):551.481.

†*Harbeck, G. Earl, Jr.; Kohler, Max A.; Koberg, Gordon E. et al., **Water-loss investiga tions: Lake Mead studies.** *U. S. Geological Survey, Professional Paper,* No. 298, **1958.** 100 p 46 figs., plate (fold. in pocket), 35 tables, 37 refs. **DGS**—The 3rd and final report on wate losses at Lake Hefner and Lake Mead, covering the March 1952–Sept. 1953 measurement and studies made on Lake Mead by U. S. Bureau of Reclamation, U. S. Weather Bureau U. S. Geological Survey and U. S. Navy Bureau of Ships and Electronics Laboratory. Th history, program, organization of project, personnel, etc. and a description of Lake Mead an its climatology, are covered in two articles by G. Earl Harbeck. Wind patterns over Boulde Basin, the network and results are analyzed by Max A. Kohler. Instrumentation an methods of water and energy budget, and mass transfer are covered by Gordon E. Koberg and energy-budget studies summarized in detail by the same author. Mass transfer studie and results are reported by G. E. Harbeck; pan and lake evaporation by Kohler, T. J Nordenson and Wm. E. Fox. The future program at Lake Mead is outlined by Harbeck and withdrawal of water from Lake Mead by the other authors. Finally, conclusions ar set forth by Harbeck and Kohler. The last part of the monograph consists of extensiv tables of daily data. Equipment and installations are illustrated by excellent full page photos and analyzed results in useful nomograms and curves presented in tables and graphs. Dat include precipitation, air temperature, incoming radiation, temperature and salinity profile at depths to 82 mm in lake, wind, humidity, reflected radiation, long wave radiation from lake pan and lake evaporation, cloud cover, etc. Some of the data were obtained at 6 to 12 station in the area (on shore, islands or barge on the lake). Both energy-budget and mass-transfe techniques were used to determine the evaporation from Lake Mead during March 1952 Sept. 1953. Sutton-Sverdrup's equations used in Lake Hefner studies could not be used o Lake Mead. Total evaporation in 1953 was found to be 875,000 acre ft, or a depth of 86 or about 7 ft, over the total area of the lake. Maximum monthly evaporation was 117″ i Aug. 1952 and minimum 40″ in Jan. 1953. Wind and humidity do not vary the same wa with height. The pan coefficient was 0.70. (For earlier reports, *see* 5.3–13, March 1954 an 7.2–11, Feb. 1956, *MAB.*) *Subject Headings:* **1. Water loss investigations 2. Evaporatio investigations 3. Limnology 4. Lake Mead, Arizona-Nevada.**—*M.R.*

10.5–5 551.509.616:551.576.11:0

*†Petterssen, S. et el., **Cloud and weather modification; a group of field experiments b S. Petterssen; J. Spar; F. Hall; R. R. Braham, Jr.; L. J. Battan; H. R. Byers; H. J. aufi Kampe; J. J. Kelly and H. K. Weickmann.** *Meteorological Monographs* (pub. by America Meteorological Society), Boston, 2(11), July **1957.** 111 p. figs., photos, tables, bibliog **DWB, DLC.** Review in *Geofisica Pura e Applicata,* 39:238, **1958.**—The monograph consis of 5 articles (with excellent photographs, maps, diagrams, tables, etc.) by the authors name above, outlining programs and procedures by government agencies in several investigation for testing the efficiency of artificial nucleation of extratropical cyclones, migratory clou systems, convective cumulus clouds, cold and warm strata, ice and fogs. This included th program of the Advisory Group on Weather Modification (1951–54), Project "Scud" (Ne York Univ.), the U. S. W. B.–A.C.N. (artificial cloud nucleation) project, the Univ. of Chicag Cloud Physics Project, and the Evans Signal Laboratory. (For listing of contents of th journal, *see* Pt. III, p. 478, March 1959, *MAB.* All articles abstracted separately.) *Subje*

Headings: **1. Cloud modification projects 2. Cloud seeding evaluation 3. Advisory Group on Weather Modification (1951–54).**—*M.R.*

10.5–6 52:08

Whipple, Fred L. (*ed.*), **New horizons in astronomy.** *Smithsonian Contributions to Astrophysics*, Wash., D. C., 1(1), **1956.** 181 p. figs., refs., eqs. **DLC** (QB461.S6)—The 1954–55 Panel of Astronomy of the U. S. National Science Foundation started a project of collecting series of papers as directed. The object is to promote a new outlook on astronomy for the advance of astronomical science. This volume of the *Smithsonian Contributions to Astrophysics* contains: techniques and instrumentation; materials on related sciences; the solar system; and the stars and galaxy. Various authors have contributed materials on: optics, solar instrumentation, rocketry, computing machines in astronomy, celestial mechanics, meteorites, meteors, solar physics, some observational problems in galactic structure and on 30 others. (For contents, *see* Pt. III, p. 1434, Oct. 1957, *MAB.*) *Subject Headings:* **1. Astronomy 2. Progress in astronomy.**—*N.N.*

TEXTBOOKS AND TECHNICAL BOOKS

See also: **Met. and agriculture** (Maksimov), 10.5–31; **Cyclopedia of weather and climate,** 10.5–38.

10.5–7 551.593.51

§*†O'Connell, D. J. K., **The green flash and other low sun phenomena.** With photos, 80 in colour, by C. Treusch. (Castel Gandolfo) Vatican Observatory; New York, Interscience Publishers, **1958.** 192 p. numerous figs., tables, 313 refs., 80 photos (in colour). **DLC** (QC976.C6023). Review by Charles H. Smiley in *Science*, 129(3357):1218–1219, May 1, **1959.** Review by James Paton in *Nature*, London, 183(4659):423, Feb. 14, **1959.**—A most thorough and scholarly study of the history and theory, observation and appearance of the green (blue and red) flash, which appears just at sunrise or sunset (or on rim of moon or Venus) with scores of excellent color photograph and the associated observational data (including radiosonde and synoptic charts) and annotations, bound in an elegant volume. Ch. I covers the history, with sample bibliographic citations; Ch. II, theory (physiological, anomalous dispersion, atmospheric dispersion, selective absorption in atmosphere, Rayleigh scattering, absorption and scattering into dust and haze); Ch. III, factors that influence the green flash (duration, intensity, mirage effects, scintillation, color, distortion) and Ch. IV, the Vatican Observatory photographs (telescope, film and development, exposure times, color movies at sunset, artificially produced green flash, reproduction techniques, etc. The catalog of color and black and white photos is arranged in 3 sections: A) the green rim (16 photos), B) the green segment with green flash (10 photos) and C) the green and red flash influenced by discontinuity layers (18 plates). An extensive bibliography, subject and author index are appended. The color photographs made by C. Treusch, S.J., at the Vatican Observatory, while not the first ever made, are the first ever published. They show definitely that the phenomenon is not subjective as was held by early observers, for the greens (and blue and red tinges) are vividly portrayed in many instances for the sun and for the moon and Venus as well. *Subject Headings:* **1. Green flash 2. Green flash photographic albums 3. Green flash bibliographies. I. Treusch, C.**—*M.R.*

10.5–8 551.511:551.513:551.509.312(02)

†Defant, Albert and Defant, Friedrich (*both, Innsbruck Univ.*), **Physikalische Dynamik der Atmosphäre.** [Physical dynamics of the atmosphere.] Frankfurt a.M., Akademische Verlagsgesellschaft M.B.H.; **1958.** 527 p. 139 figs., 28 tables, numerous eqs. Bibliog. at end of each ch. **DLC** (QC880.D42). Review in *Royal Meteorological Society, Quarterly Journal*, 84(362):478, Oct. **1958.**—This long-awaited and excellently printed textbook on dynamic meteorology gives the basic theory and facts concerning: I. Atmospheric statics; II. Thermodynamics of dry and moist air; III. Changes of state in vertical air columns, stability and instability; IV. Radiation and heat balance; V. Kinematics; VI. Equations of motion on a rotating earth; VII. Simple horizontal motions; VIII. Circulation and vorticity; IX. Discontinuity surfaces; X. Turbulence and austauch; XI. Friction and turbulence in atmosphere;

XII. Energetics; XIII. General circulation (over 170 p.); XIV. Numerical prediction and XV. Atmospheric tides. Each chapter is systematically subdivided into discrete sub-chapters, and contains a good list of classical references to the best literature on each subject up to 1951 (in the chapter on General circulation, Numerical prediction and Radiation there are a few references as recent as 1955, 1956, or 1957). Although the approach is obviously classical, the very extensive treatment of the polar, mid-latitude and tropical circulation gives in lucid form the principles of cyclo- and anticyclogenesis, zonal circulation, stratospheric circulation, jet stream, with good synoptic illustrations, zonal and meridional cross sections and models taken from work of PALMÉN, RIEHL, J. BJERKNES and ROSSBY dealing with Northern Hemisphere or North America. Its chapter on numerical prediction takes up and illustrates the theories and methods of CHARNEY, FJØRTOFT, KIBEL, EXNER, N. PHILLIPS and EADY including the advective, barotropic two-layer, 2½ dimensional and graphical integration techniques or models. *Subject Headings:* **1. Dynamic meteorology textbooks 2. General circulation 3. Numerical prediction.**—*M.R.*

10.5–9 532.5:533.6(02)

Eck, Bruno, **Technische Strömungslehre.** [Technical flow theory.] 5th ed. Berlin, Springer, **1957.** 422 p. 407 figs., 43 refs., 238 eqs. Price: DM 29.40. **DLC** (TC 171.E36). Review by Ernest Becker in *Die Naturwissenschaften*, Berlin, 45(9):219–220, May 1, **1958.**—A well-organized technical text, having the same general plan as the first 3 editions (1940, 1944 and 1948), namely: I. Hydrostatics, II. Equations of motion; III. Frictional influences in steady currents (laminar and turbulent motion); IV. Boundary problems; V. Motion of solid bodies in fluids; VI. Flow around blades and profiles; VII. Aid for avoiding separation; VIII. Cavitation; IX. Gas dynamics; X. Hydraulic measurements. On p. 251–255 is a discussion of wind pressure and flow around or over buildings, and on p. 347 erosion due to impact of drops. *Subject Headings:* **1. Hydrodynamics textbooks 2. Aerodynamics textbooks.** —*M.R.*

10.5–10 551.5:629.13(02)

§Eichenberger, Willy (*Chief, Swiss Air Training School, Zurich*), **Flugwetterkunde: ein umfassender Lehrgang.** [Aviation meteorology: a comprehensive curriculum.] Zurich, Schweizer Druck-und Verlagshaus AG, **1958.** 334 p. 16 plates, 158 figs. **DWB** (M:629.13 E34fl)—The textbook for pilots was originally written in French (1955) but was translated into German by H. V. LIECHTI, pilot of Swissair (1957) for use in Swissair pilot's training courses. The book consists of 8 chapters, each with numerous sub-headings: Ch. I, Relation between aviation and meteorology (dangerous weather, aviation weather service and flight conditions); Ch. II, Atmospheric structure and properties (pressure, temperature, humidity, altimetry, density); Ch. III, Wind, turbulence, upper air charts, general circulation, storms, jet stream; Ch. IV, Thermodynamics of atmosphere, clouds and precipitation; V, Air masses and fronts, tropical meteorology; VI, Haze, fog, thunderstorms, turbulence, icing, wind shifts and other hazardous phenomena; VII, Aviation weather service (observations, aerological soundings, reporting, synoptic analysis, forecasts for air routes and terminal communications); VIII, Weather codes. The appendices contain examples of overseas charts and flight plans, icing and cloud photographs made in the Swiss Alps, and sets of questions for each chapter for 1) private pilots, 2) commercial pilots and 3) air lines pilots, navigators and dispatchers. *Subject Headings:* **1. Aeronautical meteorology textbooks 2. Switzerland.**—*M.R.*

10.5–11 551.510.42(02)

†*Fett, Walter, **Der atmosphärische Staub.** [Atmospheric dust.] Berlin, Veb Deutsche Verlag der Wissenschaften, **1958.** 309 p. 69 figs., 40 tables, 937 refs. (*Monographien der Experimentellen und Theoretischen Physik*, ed. by Franz X. Eder.) **DWB** (M10.42 F421at) **DLC** (QC882.F4). Review by H. Koschmieder in *Beiträge zur Physik der Atmophäre*, Frankfurt a/M., 31(3/4): 277–278, **1959.**—A thorough and up-to-date technical monograph reviewing the rich literature on numerous aspects of atmospheric dust or aerosol: 1) Nature and origin (extraterrestrial, terrestrial, artificial), characteristics of dust, measurement, distribution in atmosphere and 2) Effects of dust: geophysical (weather and climate, upper atmosphere, meteoric, volcanic, nucleating hydrosphere and use as tracer); geological (loess and marine sediments)

botanical (damage, radiation changes, pollen analysis) and physiological and hygienic (allergies, industrial dust, explosions). Besides a detailed subject index and a very extensive bibliography (by chapter headings), there is an expanded UDC list in all fields of knowledge applicable to the dust problem. *Subject Headings:* **1. Dust textbooks 2. Dust bibliographies.**—*M.R.*

10.5–12 550.3(02)

Haalck, Hans, (*ed.*), **Lehrbuch der angewandten Geophysik, Teil II.** [Textbook of applied geophysics, Vol. 2.] 2d rev. and enl. ed. Berlin, Borntraeger, **1958.** 329 p. 222 figs., 16 tables, 20 charts (in pocket), eqs. **DLC** (QE501.H232). Review in *Geofisica Pura e Applicata*, 40:254, **1958.**—Most of this volume deals with electrical and seismic methods of geophysical prospecting. Sec. V (p. 196–281) covers systematically gas analysis, radioactive measurement and thermal techniques of geophysical analysis and measurements; theory, pressure and temperature variations with depth, instrumentation, chemical analysis, interpretation, influence of extraneous factors, geochemical measurements in bore holes; natural radioactivity and its measurement, units, equipment (ionization, Geiger and scintillation meters), amount of radioactivity in various types of rock, field equipment and methods; laboratory research and testing, errors in analysis and computation; heat transfer, geothermal regions, equipment and methods, examples and application to petroleum prospecting. *Subject Headings:* **1. Geochemical methods 2. Geothermal techniques 3. Natural radioactivity measurement 4. Applied geophysics textbooks.**—*M.R.*

10.5–13 551.5:63(02)

†*Kiriakov, Kiril P. and Todorov, T., **Meteorologiia i klimatologiia, s osnovi na zemedelskata meteorologiia.** [Meteorology and climatology, with the elements of agricultural meteorology.] Sofia, Zemizdat, **1957.** 234 p. 40 figs., 23 tables, 71 refs. **DLC** (QC861.K56)—A standard elementary textbook on meteorology, with special emphasis on those aspects of interest to agricultural students, research workers and operating personnel. The 25 chapters are divided into 3 main sections: I. Meteorology, II. Climatology and III. Fundamentals of agricultural meteorology. In Pt. I the atmospheric radiation, temperature of soil and of air, humidity, evaporation, condensation of water vapor, haze, clouds, precipitation, wind and weather (and forecasting) are treated in separate chapters. In Pt. II the regional climatic variations, climatic classification, the climate of Bulgaria and climate of regions of Bulgaria are treated. In Pt. III microclimate, control of climate by man, unfavorable climatic or weather conditions (drought, freezing, and spring or autumn frost), seasonal phenomena, agricultural climatology and agrometeorological service of the Hydrometeorological Service are covered. The text contains a number of tables of climatic data for Bulgaria, some schematic diagrams and charts (synoptic and climatological), and a bibliography valid through 1956 (mainly Russian and Bulgarian works). *Subject Headings:* **1. Agrometeorology textbooks 2. Climate of Bulgaria 3. Bulgaria.**—*M.R.*

10.5–14 551.58(02)

†Landsberg, Helmut (*Dir., Office of Climatology, U. S. W. B.*), **Physical climatology.** 2d ed. DuBois, Pa., Gray Printing Co., **1958.** 446 p. 109 figs., 224 tables, bibliog. at end of each ch. Price: $6.00. **DWB**—This second edition of a popular college textbook, first issued in 1941, has been completely revised and rewritten to take into consideration advances in climatology made during two very active decades in this branch of meteorology. The present edition contains a multitude of information for an elementary college text, and aside from its thorough and systematic coverage of every aspect of "pure" and applied climatology, it has scores of illustrative figures and tables, excellent lists of up-to-date and well chosen references, an author and a subject index. The 55 sections are divided among 10 major sections under the four main chapters: 1) Collection and use of climatic data (methods, observations, instruments, stations and networks); 2) Climatological elements (atmospheric heat balance, simple elements and complex elements); 3) Combinations of elements (world climate, regional climate, local climate, spot climate and climate control); and 4) Applied climatology (geographic systems, biological and agricultural relations and technoclimatology, and climatological aids to forecasting, space relation trends and fluctuations). *Subject Headings:* **1. Climatology textbooks 2. Physical climatology 3. Applied climatology.**—*M.R.*

10.5–15 551.58:519.24(02)

†Leningrad. Glavnaia Geofizicheskaia Observatoriia, **Metody klimatologicheskoĭ obrabotki meteorologicheskikh nabliudeniĭ.** [Methods of climatological analysis of meteorological observations.] [Edited by O. A. Drozdov.] Leningrad, Gidrometeoizdat, **1957.** 492 p., 180 figs., 226 tables, bibliog. p. 490–492. **DLC** (QC981.L44)—The editor of this new manual or textbook in climatological methodology (2000 copies) prepared an elementary text (9.4–4, April 1958, *MAB*) which was published in 1956, and which gave the general methodology based on classical examples. The present work is a more thorough and extensive textbook setting forth the detailed methods of analysis of meteorological data for climatological purposes used by the scientific workers at the main Geofizicheskaia Observatory in Leningrad. The text is divided into 6 main chapters and over 30 sub-chapters. Ch. I covers general principles and statistical cartographic methods. Ch. II covers the processing of surface weather data (temperature, pressure, wind, precipitation, snow cover, humidity, cloudiness, sunshine, soil temperature, fog, snowstorms and thunderstorms). Ch. III goes into processing of aerological data (upper air temperature, tropopause, inversions, freezing level, tropospheric winds and humidity, cloud heights, icing frequency and synoptic climatology according to air flow). Ch. IV covers marine climatology (accuracy of observations, problems of location, annual course of elements, frequencies, special elements such as pressure, temperature of sea and air, humidity, clouds, rain and fog, wind, ice cover, humidity deficit, marine climatic charts, and interpolation of marine charts and tables for long period or regional comparisons). Ch. V deals with moisture balance calculations (general circulation, evaporation and precipitation relations) and Ch. VI with heat balance calculations, (heat balance of underlying surface, radiation balance, heat exchange due to evaporation and turbulance, and examples). *Subject Headings:* **1. Climatological methodology 2. Statistical methods in climatology 3. Climatological cartography. I. Drozdov, O. A.** (*ed.*).—*M.R.*

10.5–16 551.4 551.582.2(472)

*†Nezhikhovskiĭ, Ruvim Afroimovich, **Reka Neva.** [Neva River.] Leningrad, Gidrometeoizdat, **1957.** 2d ed. rev. and enl. 191 p. 53 figs., 38 tables, 32 refs. **DLC** (GB1308.N4N47 1957). Review by S. V. Kalesnik in *Vsesoiuznoe Gegraficheskoe Obshchestvo Leningrad, Izvestiia,* 90(2):119–200, March/April **1958.**—A popular technical book on the physical geography and history of the Neva in commemoration of the 250th anniversary of Leningrad, which is situated near its mouth. The features of the Neva Basin, past and present aspects, history, climate (p. 58–65) including tables of monthly means and extremes of temperature (1881–1956), precipitation, humidity, wind, sunshine, cloudiness, fog, glaze, etc., water balance of Lake Ladoga, runoff (seasonal and year-to-year), water levels (tides, storm tides, influences of lake on river level, of Gulf of Finland on Lake Ladoga, of ice cover, wind waves) high and low water, flood frequency, flood hydrograph characteristics, causes of floods (a synoptic example is given), ice and breakup, water characteristics, use of river in commerce and industry and erosion control are covered. A great deal of tabular data and photographs, charts, nomograms, etc. are included. *Subject Headings:* **1. Physical geography, Neva River 2. Climate of Leningrad 3. Ice, Neva River 4. Lake Ladoga, U.S.S.R. 5. Neva River, U.S.S.R. 6. Leningrad, U.S.S.R.**—*M.R.*

10.5–17 551.5:629.13(02)

Noth, Hermann, **Wetterkunde für Flieger.** [Meteorology for aviators.] 8th enl. and rev. ed. Bielefeld, Klasing, **1956.** 140 p. 67 figs., 9 refs. **DLC** (TL556.N6 1956). Pub. in 1936 under title: *Wetterkunde für Flieger und Freunde der Luftfahrt.*—An up-to-date elementary text on aviation weather with numerous illustrations of equipment, charts, weather maps and schematic diagrams pertinent to aviation. Chapters are included on atmospheric structure, composition, the troposphere and stratosphere, density and pressure, barometer, weather map, altitude measurement by barometer, wind and squalls, temperature and measurement thereof, Bjerknes model, humidity, vertical motion and cloud formation, precipitation, cloud forms, thunderstorms, visibility, mountain influences, icing of aircraft, observation networks and organization, highs and lows, forecasts, aerology, foreign aviation weather, meteorological service in West Germany, and flying weather conditions at night. *Subject Headings:* **1. Aeronautical meteorology textbooks 2. West Germany.**—*M.R.*

10.5–18 551.521.3(02)

*†Piaskovskaia-Fesenkova, E. V., **Issledovanie rasseianiia sveta v zemnoĭ atmosfere.** [Investigations on light scattering in the earth's atmosphere.] Moscow, Akademiia Nauk SSSR, **1957.** 217 p. 106 figs., 65 tables, 104 refs., 172 eqs. **DLC** (QC976.T6P5). Summary in *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 12:1533–1534, **1957.**—A monographic text on every aspect of light scattering in the atmosphere: Ch. I covers basic concepts and determinations of (1) attenuation and (2) scattering. Ch. II takes up instruments and methods of observation: (1) photometry of the daytime sky, (2) coronal photometer, (3) effect of wave length, and (4) accuracy of measurements. Ch. III, Brightness of the daytime sky: (1) formula involving first order scattering, (2) observation of daytime sky brightness during clear skies, (3) theory of multiple scattering and comparison with observations. Ch. IV, Atmospheric indexes of scattering. Ch. V, Calculations of multiple scattering. Ch. VI, Criteria of stability of optical atmospheric characteristics. Ch. VII, Methods of determining the coefficient of extinction during clear skies. The theory is covered in detail in each chapter and supported by or compared with empirical data presented in scatter diagrams, curves, tables, etc. *Subject Headings:* **1. Atmospheric scattering 2. Atmospheric optics textbooks.** —*M.R.*

10.5–19 551.586:612.592:355

*Whayne, Tom F., **Cold injury, ground type, prepared under the direction of S. B. Hays.** Editor in Chief, John Boyd Coates, Jr. Wash., D. C., Office of the Surgeon General, Dept. of the Army, **1958.** 570 p. 31 charts, 105 figs., 52 tables. **DWB** (616.988 W555co)—History of cold injury in and before World War I and II, the nature, epidemiology, damage to military operations, care, rehabilitation, prevention and control are treated in the various chapters of this book. The historical chapters discuss cold injury in each war since the Napoleonic Wars, in World War II in different zones—U. S., Aleutians, North Africa, Europe and the Pacific (tropics and wet cold area). Dozens of statistical tables and charts give cases versus mean temperature and precipitation and other environmental factors in different theatres. Temperature, precipitation and wind-chill are discussed on p. 404–417, numerous examples of temperature ranges in cold injury are given throughout the book. Trenchfoot and frostbite are the two main types of cold injury figuring in the statistics, although many other types are considered. *Subject Headings:* **1. Cold injury to skin 2. Wind-chill data 3. Wet-cold effects 4. Military bioclimatology. I. Coates, J. B., Jr.** (*ed.*).—*M.R.*

10.5–20 551.507.362.2

*†Burgess, Eric, **Satellites and spaceflight.** N. Y., Macmillan, **1957.** 159 p. figs., tables, bibliogs. throughout. **DWB** (629.1388 B55sa). Review by C. R. Darlington in *Weather*, London, 13(4):138, April **1958.**—Many technical details of rocketry, satellite observation, moon rockets, moon expeditions, lunar bases and interplanetary flight are given in this popular and well-illustrated book. The theoretical and empirical data cited is well documented, and the illustrations are excellent for clarifying the principles and techniques of space missile or flight. All of the data were obtained before either the Soviet or U. S. satellites had been launched. *Subject Headings:* **1. Rocketry 2. Satellite observatories 3. Space flight 4. Astronautics.**—*M.R.*

MONOGRAPHS AND COMPREHENSIVE PAPERS

See also: **Japanese participation in IGY,** 10.5–43; **Agroclimatic handbook of Chelyabinsk Region** (Skovronskaia, Andrushko), 10.5–119; **Flood damage, U. S.** (1952–1955), 10.5–312.

10.5–21 551.553:628.13(478)

§*Anapol'skaia, Liia Evseevna, **Vetrovoĭ rezhim vodokhranilishch stepnogo raĭona.** [Wind conditions over reservoirs in the steppe region of the European territory of U.S.S.R.] Ed. by D. A. Drozdov. Leningrad, Gidrometeoizdat, **1956.** 61 p. 14 figs., 28 tables, 13 refs. **DLC** (QC940.R9A7)—Wind direction, speed and duration data (frequencies on various limits on above specified values) are given in tables and analyzed graphically for several stations in

the Stalingrad, Tsimlyansk, and Kuibyshev watersheds (Don-Volga Basin). Extreme value from different directions relating to synoptic conditions (a number of synoptic cases ar presented and analyzed to show extent of area over which gale winds have blown at a given time in this region exposed to widespread cyclonic storms) are presented. Speeds of 40 m/se can occur 2–3 times in 10 yrs over a limited area. Storms of >15 m/sec can last for 40 hr and >20 m/sec for 25–30 hrs at least 2–3 times in a century. The work is intended for use i hydrotechnical design and construction, but could be used for wind power estimates. *Subje Headings:* **1. Wind conditions over reservoirs 2. Wind duration frequency data 3. Win power surveys 4. Gale frequencies 5. Don-Volga Basin. I. Drozdov, O. A.** (*ed.*).—*M.R.*

10.5–22 551.583.2(47

†Buchinskiĭ, I. E., **O klimate proshlogo Russkoĭ ravniny.** [Past climate of the Russia plain.] Leningrad, Gidrometeoizdat, **1957.** 141 p. 9 figs., 6 tables, 275 refs. **DL** (QC989.R49B8). Review by V. P. Shumeĭko in *Meteorologiia i Gidrologiia*, Leningrad, No 10:48–50, Oct. **1957.**—The author has examined numerous chronicles, manuscripts, account of travels or expeditions, etc. and has considerably extended and expanded the material i his 1954 work: **Notes on the climate of the Russian plains in historical times.** The firs chapter takes up the climate of the post-glacial period, as deduced by a number of Russia authors from archaeological and paleontological evidence. The climate became warm an moist during this epoch, then at the end of the paleolithic it became dry or even very dry Ch. II takes up the period from the 5th century B.C. to the sixth century A.D. as witnesse by ARISTOTLE, HERODOTUS, SENECA, and others. Ch. III gives an inventory of climat sources for the 9th–18th century, including a year-by-year chronicle of unusual weather event and a summarizing table of frequency of various types of events. Ch. IV catalogs the recorde sources and comments on climate of various parts of the Ukraine and steppe regions of southern Russia in the 13th–18th centuries. Ch. V discusses climatic fluctuations in the Ukraine in th 19th and 20th centuries and gives graphs and tables to show the decadal or smoothed, long period variations. The general secular tendency or tendencies are summarized. At presen the rainfall seems to be decreasing at an increasing rate—at least since 1940. *Subject Heading* **1. Historical climates 2. Climatic changes in Ukraine 3. Ukraine, U.S.S.R.**—*M.R.*

10.5–23 523.164 523.

†Carnegie Institution of Washington, **Yearbook, No. 56, July 1, 1956–June 30, 195** Wash., D. C., **1957.** 425 p. figs., tables, bibliogs. Reports of departments and speci studies: p. 37–75, Mount Wilson and Palomar Observatories. p. 81–87, Dept. of Terrestri Magnetism. p. 149–252, Geophysical Laboratory. **DWB**—The report on the Mt. Wilso and Palomar Observatories describes the work in progress and some of the results of sol research (solar photography, sunspot activities, solar magnetic fields, geomagnetic relation radio sources, etc.). The report of the Department of Terrestrial Magnetism goes into radi astronomy research—radio emissions from the sun, Jupiter and Venus, upper air winds an radio star scintillations, etc. The IGY program is outlined. Extensive bibliographie accompany each report. (*See* 8.1–37, Jan. 1957, *MAB*, for 1954/5 Yearbook.) *Subje Headings:* **1. Solar astrophysics investigations 2. Radio astronomy research 3. Yearbook** —*M.R.*

10.5–24 551.579(569.4)(058)551.577(569.4

*Israel. Hydrological Service, **Hydrological Year-Book of Israel, 1954/1955; 1955/195** Issued Jerusalem, **1957; 1958.** 255 p; 263 p. (2 pieces). In Hebrew and English. Most tables. **DWB**—The yearbook has the same format and contents as previous yearbook except that the normal period for rainfall is 1921/50 instead of 1901/30 as heretofore (excep in the Jordan catchment). Histograms or curves show monthly rainfall, chlorine conten elevation of water table and yield for each of 750 rivers, springs, wells and wadis for the h drologic year (Oct.–Sept.). In 30 cases, daily water level or runoff values are shown o histograms, along with other hydrologic and precipitation data. The same information given for Lake Tiberias. *Subject Headings:* **1. Hydrology yearbooks 2. Precipitation da 3. Annual hydrological reports 4. Israel.**—*M.R.*

10.5–25 551.575(573)

§*Japan. Hydrographic Dept., **Fog (in the) Kurile Islands and adjacent areas.** Aug., **1939.** 363 p. 123 figs., 14 charts (fold.), 8 plates, 166 tables. In Japanese. (Title romanized: **Chishima Homen no Kiri.**) **DWB** (M75 J35fo)—A large volume containing, besides the comprehensive text, extensive tables of data for all places in the Kurile Islands having available weather data charts and tables showing fog by wind direction for a score of stations (from 1 to 4 on each island from Kamchatka to Hokkaido), and about 120 synoptic charts showing pressure conditions at times when fog was present at various places in the Kuriles (arranged by months of the year). Tabulations show incidence of fog at various hours of the day, temperatures, wind direction and speed, etc. Relations are also shown graphically in text. *Subject Headings:* **1. Fog statistics 2. Fog, Kurile Islands 3. Synoptic conditions for fog 4. Fog climatology 5. Kurile Islands.**—*M.R.*

10.5–26 551.574.7:629.13

*†Mazin, I. P., **Fizicheskie osnovy obledeneniia samoletov.** [Physical bases of airplane icing.] Moscow, Gidrometeoizdat, **1957.** 119 p. 33 figs., 16+5 tables, 80 refs., eqs. At head of cover-title: Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby pri Sovete Ministrov SSSR, Tsentral'naia Aerologicheskaia Observatoriia. **DWB**—A sizeable monograph treating the various aspects of aircraft icing: aerodynamic aspects of a body moving through a monodisperse aerosol (coefficients of accretion, accretion on different forms of bodies and on aircraft wings), aerodynamic encounters on bodies in a polydisperse aerosol current (spectral distribution of drop size in clouds, supercooled clouds, intensity of icing on various parts of airplanes). Heat exchange processes in aircraft icing, experimental research on icing of aircraft, velocity and temperature fields around planes, classification of types of icing, experimental verifications of theoretical calculations, icing in flight and, finally, icing of high speed and supersonic planes are also considered. Extensive tables of empirical coefficients obtained by Zhukovskiĭ are appended. The extensive bibliography is composed half of Russian and half of non-Russian literature. Not only theory but also numerous nomograms and curves based on laboratory and field tests are included. *Subject Headings:* **1. Icing of aircraft 2. Cloud physics experiments. I. Moscow. Tsentral'naia Aerologicheskaia Observatoriia.**—*M.R.*

10.5–27 551.509.33:551.509.5:355

National Defense Research Committee, **Long-range weather forecasting for military purposes.** A report submitted by the Committee on Evaluation of Long-Range Weather Forecasting for the Army Air Forces to the Applied Mathematics Panel, National Defense Research Committee. Its *AMP Report*, No. 1.1, Oct. 1, **1943.** 2 vol. (26+208 p.) figs., tables. **DWB** (M09.3 N277Lo)—In the first volume there is a condensed account of the purposes and conclusions of the committee, the problem of evaluating weather forecasts, types of forecasts evaluated (AAF block forecasts, USWB extended forecasts (2) and Research Council of Pasadena (Krick) forecasts). Accuracy of the forecasts of each group and a summary at the time of the (1943) status of extended and long range weather forecasting and the problem of forecasting for military purposes are considered in systematic fashion. The second volume (Pt. II, Technical Supplement) contains a very detailed mass of supporting tabular, graphic and textual information obtained from the elaborate verification project which embraced the comparison of forecasts for 1 to 31 days in comparison with persistence for the same period, for representative places in the U. S., Canada, and Alaska. All types of forecasts are verified: general temperature and precipitation; aviation (ceiling, instrument and contact weather) or air route forecasts; fair warm, cold and stormy forecasts, pressure forecasts, etc. Conclusion is inescapable, from graphical comparisons, that in most cases, especially after 3 days, persistence forecasts are well above those of any of the 4 systems in skill. *Subject Headings:* **1. Long range forecasting skill 2. Extended forecast verification 3. Aviation forecast skill 4. Military forecasts 5. North America. I. Mead, Warren J. II. Wilks, S. S. III. Weaver, Warren IV. Committee on Evaluation of Long-range Weather Forecasting.** —*M.R.*

10.5–28 551.510.53:621.396.11(02)

Boudouris, G., **Propagation troposphérique.** [Tropospheric propagation.] Paris, Centre de Documentation Universitaire, **1957.** 463 p. numerous figs., eqs., bibl. p. 459–463.

Mimeo.—The author presents in this work a synthesis of present knowledge concerning the propagation of radioelectric waves. The work is composed of 7 parts which deal successively with: 1. Propagation of plane waves; 2. Theorems and general notions. Specific waves 3. and 4. Propagation over a level continent; 5. Propagation over the spherical earth; 6. Propagation over a nonhomogeneous world. Influence of irregularities of the ground and obstacles 7. Propagation in real troposphere (nonhomogeneous). *Subject Heading:* **1. Tropospheric propagation textbooks.**—*A. V.*

10.5–29 551.583

Arakawa, Hidetoshi, **Discussion of climatic changes.** T-p. and text in Japanese. [1958.] 82 p. 16 figs., 26 tables. (Title romanized: **Kiko Hendo Ron.**) **DWB** (M83 A659ki)—A small but well-printed book giving the results of extensive statistical studies of climatic changes in Japan and elsewhere, based on records of cherry blossoms, freezing of lakes, etc., going back to 812 in one case and to 1119, 1440, 1690, 1750, 1810, 1883 and 1945, respectively, for other cases. General circulation indices, atom bombs, volcanic eruptions, Yangtze floods, Indian monsoons, tree rings, sunspots and many other indicators or suspected operators are considered in separate chapters, with illustrative tabular or graphic data to support each argument. Theories of DRAYSON, KÖPPEN, WIESE (VIZE)], C. EASTON, S. W. VISSER, A. E. DOUGLASS, L. A. RAMDAS and others are cited. *Subject Heading:* **1. Climatic changes.**—*M.R.*

POPULAR METEOROLOGY

10.5–30 551.584:63

Gol'tsberg, Ida Arturovna, **Mikroklimat i ego znachenie v sel'skom khoziaĭstve.** [Microclimate and its importance in agriculture.] Leningrad, Gidrometeoizdat, **1957.** 65 p. 23 figs., 9 tables. **DLC** (S600.G6)—A popular bulletin on the influence of topography, water courses or bodies of water, irrigation and drought areas on microclimate and hence on agriculture. Methods of observation and analysis, natural microclimates or topoclimates, diurnal and seasonal variations, snow drifting and microclimate of shores of lakes or banks of rivers, artificial microclimates, effect of cultivation and cover, of drainage of marshes, of forested areas and, finally, use of microclimate for increasing productivity in different climatic zones by increasing temperature or humidity, snow cover, etc. *Subject Headings:* **1. Microclimate and agriculture 2. Agricultural climatology 3. Artificial microclimate.**—*M.R.*

10.5–31 551.5:63(02)

Maksimov, Sergeĭ Andreevich, **Meteorologiia i sel'skoe khoziaĭstvo.** [Meteorology and agriculture.] Leningrad, Gidrometeoizdat., **1955.** 141 p. 55 figs., 19 tables. **DLC** (S600.M42 1955)—In the present (1955) edition (10,000 copies), the 1952 (2nd) edition of this popular-technical text on agricultural meteorology has been considerably expanded in size and has double the number of illustrations. The general arrangement of chapters has not been changed, except that Ch. VI of the 2nd ed. (which glorified the Stalin Plan for changing nature in the U.S.S.R., and emphasized the tremendous significance of the works of Lysenko) has been completely deleted. The remaining chapters deal with: I. History of agrometeorology; II, Work at an agrometeorological station; III, Effect of solar energy, soil heat regime, air temperature, precipitation, snow cover, soil moisture, air humidity, pressure and wind on plant growth; IV, Combatting of drought, dry winds, frost, hail, showers, ice, freezing, excess moisture, excess drying of plants and, finally, V. Service to agriculture of the agrometeorological stations and personnel in the U.S.S.R. Considerable experimental data and illustrations of instruments for weather-crop studies have been added. (For abstract on 1952 ed. (94 p.) *see* 5.1–20, Jan. 1954, *MAB.*) *Subject Headings:* **1. Agrometeorology textbooks 2. U.S.S.R. agrometeorological service 3. U.S.S.R.**—*M.R.*

10.5–32 551.590.2

Mustel', E. R., **Solntse i atmosfera Zemli.** [Sun and the earth's atmosphere.] Moscow, Gosud. Izdatvo Tekhniko-Teoreticheskoĭ Literatury, **1957.** 102 p. 23 figs., 3 refs. **DWB** (M90.21 M991so)—A popular science book covering present knowledge of the sun, its structure, atmosphere, activity, ultraviolet radiation and its effect on the upper atmosphere; corpuscular

adiations and their influence on the upper atmosphere; effect of solar activity on the lower ayers of the atmosphere; observations of solar activity during IGY, and solar weather relations. Photos of observational equipment and statistical graphs are included in the illustrative naterial. *Subject Headings:* **1. Solar-terrestrial relationships 2. Solar activity.**—*M.R.*

10.5–33 551.510.5

Liapunov, B. V., **Výzkum atmosféry.** [Exploring the atmosphere.] Prague, Naše Vojsko, **1954.** 93 p. 17 figs. Transl. by Jaroslav Ruprecht of Russian **Rasskazy ob atmosfere. DLC** (QC863.L633)—Achievements (mainly of scientists in the Soviet Union) in atmospheric research by means of stratospheric balloons, radiosondes, ionospheric radio propagation, cosmic radiation, radar and rockets are reviewed on a level accessible to school children (for whom the original edition was prepared). *Subject Headings:* **1. Upper atmosphere research 2. Elementary meteorology 3. Translations.**—*G.T.*

10.5–34 551.501.9:91.04(98)

Makoveev, Mikhail Stepanovich, **Poliarnyĭ dnevnik.** [Arctic diary.] Moscow, Gos. Izd-vo Geogr. Lit-ry, **1955.** 95 p. **DLC**—Diary of a newspaper reporter who took part in the aerial journey from Moscow to Cape Schmidt. He mentions the personnel of drifting station North Pole 4, aerial reconnaissance and selection of the ice floe, the air lift of personnel and equipment for the future station. He spent several days on the floe during the organization of the station. The author notes some characteristics of the leading personnel of the expedition, both Arctic fliers and scientific workers, with comments on their previous activity and present duties. The book contains some descriptions of snow storms and auroras observed during the trip. On the return voyage to Moscow, a short visit was made to the drifting station North Pole 3 and the celebration of May 1st there is described. *Subject Headings:* **1. Arctic diaries 2. Drift ice meteorological stations 3. Soviet ice floe stations 4. Arctic.**—*A.M.P.*

10.5–35 551.578.46:551.311.1(491,98)8

Wustmann, Erich, **Wo das Eis die Grenze schuf; bei Menschen, Tieren und Pflanzen in der Eisregion.** [Where ice sets the limits for people, animals and plants in the region of ice.] Radebeul, Germany, Neumann-Verlag, **1954.** 192 p. photos. **DLC** (G608.W9)—A narrative style book with dozens of excellent photographs of glacier ice, snow and pack ice as well as other scenes of Iceland and Greenland, where the author spent a year in botanical exploration. His descriptions of ice and weather in the various parts of the land are, like the photographs, vivid and enlightening. *Subject Headings:* **1. Glacier photographs 2. Iec exploration 3. Iceland 4. Greenland.**—*M.R.*

10.5–36 551.577.38(47)

Zavarina, M. V., **Zasukha i bor'ba s neĭ.** [Drought and the battle against it.] Moscow, Gos. Izd-vo Geogr. Lit-ry, **1954.** 84 p. 14 figs., tables. **DLC** (QC929.D8Z3)—A pamphlet discussing the historic droughts of the southeastern part of European U.S.S.R. and western Siberia, the frequency of drought in these areas, causes of drought (synoptic), dry winds, effect on plants, evaporation, methods of amelioration, drought and dry winds through changing radiation balance, irrigation, snow conservation or forest belts, methods of measuring climatic changes, and of determining effect of forests or trees on meteorological elements and, finally, the effect of irrigation on meteorological elements. Many schematic diagrams show physical influences of trees or irrigation. The Pakhta-Aral micrometeorological expedition of 1952 to an oasis in Central Asia is described on p. 58–59. *Subject Headings:* **1. Drought 2. Popular meteorology 3. Conservation 4. U.S.S.R.**—*M.R.*

MANUALS AND GLOSSARIES

See also: **Agroclimatic handbooks, Asiatic U.S.S.R.** (Skovronskaia, Andrushko), 10.5–119.

10.5–37 551.46(03)

Anglo-russkiĭ okeanograficheskiĭ slovar'. [English-Russian dictionary of oceanographical terms.] Ed. by N. N. Gorskiĭ and Vera I. Gorskaia. Moscow, Gos. Izd-vo Tekhniko-Teoret.

Lit-ry, **1957.** 292 p. Added t-p. in English. **DLC** (GC9.A5)—About 8000 terms relati to marine hydrology, glaciology, meteorology, biology and geology, to fishing industry a marine hydrotechnology are given alphabetically in English, with the Russian equivalent equivalents. An index to the Russian terms is appended, with reference to the page a column (2 cols.) on which the Russian term will be found following its English equivale *Subject Headings:* **1. English-Russian oceanographic glossary 2. Russian-English ocean graphic glossary 3. Oceanographic glossaries. I. Gorskaia, Vera Ivanovna** (*ed.*) **II. Gorsk N. N.** (*ed.*).—*M.R.*

10.5–38 551.5(0

Cyclopedia of weather and climate. Enlarged ed. Tokyo, Japan, Tenensha Co., Lt July, **1957.** 393 p.+24 p. subject index (in English) and 60 p. charts and tables. In Japane (except title on cover and on title page). (Title transliterated: **Kishō Jiten. Zōhohan. Te nensha Kan**). **DWB** (M(03) C995cy)—An up-to-date glossary in which about 3000 meteor logical and allied terms are defined at some length in Japanese, with English equivalents a an alphabetical list of terms in English. A list of meteorological journals, plus tables climatic data, synoptic charts illustrating typhoons and other weather types, climatic char typhoon track charts and other illustrative material is appended or interspersed throughout t text. A great many agrometeorological terms are included. *Subject Headings:* **1. Meteor logical glossaries 2. Japanese language.**—*M.R.*

10.5–39 551.501.1:551.593.63(0

†Grishin, N. I., **Instruktsiia dlia nabliudenii serebristykh oblakov.** [Instructions f observations of noctilucent clouds.] Moscow, Izd. Akademii Nauk SSSR, **1957.** 22 6 figs., tables, 27 refs. Transl. into English by John Miller. Issued by American Meteor logical Society, under Contract AF 19(604)-1936, June **1957.** 43 p. illus. etc.—Gener information on noctilucent clouds, a morphological classification, characteristics of noctiluce clouds, seasonal and year-to-year frequency variations, period and system of observatio during IGY, the observation site and equipment, visual observations, theodolite observation photographic and other types of observations, data collection, sample data sheets, a numb of good photographs of noctilucent clouds, and a fairly good bibliography complete the manu *Subject Headings:* **1. Noctilucent cloud observation manuals 2. Observers manuals.**—*M.R.*

10.5–40 551.508.822(0

Khakhalin, Viktor Stepanovich, **Radiozondy.** [Radiosondes.] Leningrad, Gidr meteoizdat, **1955.** 74 p. 26 figs., 2 tables. (*Nauchno-Populiarnaia Biblioteka.*) **DL** (QC876.K5)—A pamphlet giving the history of the meteorograph and radiosonde in t U.S.S.R. and abroad, and describing in detail the various principles and types of constructi used in the U.S.S.R. and abroad and, finally, suggested improvements or developments radiosonde construction and technique. The types described and illustrated are the fi "comb" radiosonde, the 1934 comb radiosonde, two improved types of comb radiosonde, t RZ-035 (1939), RZ-043 (1944), RZ-043M (1949–51), RZ-049, the commutator radiosonde, t URZP (1942) radiosonde, and the "Volna." The foreign models described and illustrat are the code types: Dutch, Graw, German, Lang; high frequency types: Väisälä, Becke low frequency: U. S., English, etc. *Subject Headings:* **1. Radiosondes 2. Radiosonde manua** —*M.R.*

NEW SERIALS

See also: **Cairo. Sci. and Tech. Documentation Centre, Bulletin,** 10.5–96.

10.5–41 551.5:551.46(0

Bristow, Gerald C. (*ed.*), **Introducing the Mariner's Weather Log.** *Mariners Weath Log*, Wash., D. C., 1(1):1, Jan. **1957. DWB**—The first issue (Jan. 1957) of the *Marine Weather Log*, issued bi-monthly by the U. S. Weather Bureau's Office of Climatology, Mari Area Section, contains a message from the Chief (F. W. Reichelderfer) and a note on t history and objectives of the publication by the editor, G. C. Bristow. It is intended as a ne and information, as well as a data, bulletin for mariners giving a log of weather and mari

events over the oceans and Great Lakes. The section of the *Monthly Weather Review*, devoted to **Weather of the Oceans** which was dropped during World War II, has been revived in this new publication. *Subject Headings:* **1. Serial publications 2. Marine meteorology publications.**—*M.R.*

TRANSLATIONS

See: **Exploring the atmos.** (Liapunov), 10.5–33; **Obs. of noctilucent clouds** (Grishin), 10.5–39; **U.S.S.R. Central Inst. of Forecasting** (Khrabrov), 10.5–72; *see also* **Translations,** p. 795. **Met. training course** (Neuberger, Teweles), 10.5–78 to 10.5–81.

GENERAL GEOPHYSICS AND METEOROLOGY

IGY

10.5–42 551.506.22

The International Geophysical Year. *Institution of Electrical Engineers, Journal,* New Ser., 3(26):73, Feb. **1957. DWB, DLC**—A brief historical summary of geophysical studies of the earth is given in this paper. Earlier investigations date back to 1882–83 and 1932–33 during the First and Second International Polar Years. This idea has been transformed into an International Geophysical Year (1 July 1957–31 Dec. 1958) for the study of the physical properties of the earth, its atmosphere and associated phenomena such as cosmic rays, auroras, magnetic and ionospheric storms. *Subject Heading:* **1. International Geophysical Year, 1957–1958.**—*N.N.*

10.5–43 550.3:551.506.22(52)

International Geophysical Year, 1957/1958. Japanese National Committee for the IGY, **Japanese contribution to the International Geophysical Year, 1957/1958.** Ueno Park, Tokyo, Japan, National Committee of the IGY, Science Council of Japan, March **1958.** 178 p. figs., photos, tables.—The detailed and complex program for IGY being carried out by the Japanese National Committee for the IGY is outlined and the stations in each discipline listed and shown on maps. Equipment, sites of stations, ships, networks, sample records, computers, recorders, etc. are shown on photographic plates or maps, interspersed in the text which gives details of the scientific program. Names of members of the various committees are listed. The Radio Research Laboratories of the Ministry of Posts and Telecommunications serves as the Regional Warning Center for the Western Pacific Region. The main effort represented in the report lies in the fields of meteorology, geomagnetism, aurora and airglow, ionospheric physics, solar activity, cosmic rays, oceanography, seismology, gravimetry, rockets, satellite observations and nuclear radiation. World data centers are established in Japan for geomagnetism, airglow, ionosphere, cosmic rays and nuclear radiation. Publications of the Japanese National Committee for IGY are listed and described. Some very elaborate and expensive equipment is shown. A list of 88 stations in Japan and vicinity and in the Antarctic, their coordinates and the discipline or disciplines for which they are equipped, are included. Also proceedings of the IGY Western Pacific Regional Conference, Feb. 25–March 2, 1957 in Tokyo, is appended on page 155–178. *Subject Headings:* **1. Japanese participation in IGY 2. IGY networks 3. Japan.**—*M.R.*

10.5–44 551.507.362.1:551.506.22(712.7)

Rocket results at Fort Churchill. *American Geophysical Union, Transactions,* 39(4):778–782, Aug. **1958.** fig., table. **DWB, DLC**—By July 1, 1958, a total of 116 rockets had been fired in the US-IGY Rocket Program. This number includes rockets fired in programs conducted at Fort Churchill (21 Aerobees, 20 Nike-Cajuns); White Sands (two Nike-Cajuns, one Aerobee, one Nike-Asp); Alamogordo, N. Mex. (two Aerobees); Point Mugu, San Nicolas Island, Calif. (14 Nike-Deacons, one Nike-Asp); a shipborne operation in the Arctic (18 Rockoons); and a shipborne operation in Pacific and Antarctic waters which was concluded in mid-November 1957 (36 Rockoons). (*IGY Bulletins* 7, 5 and 11 give accounts of the latter 3 operations.) The major effort of the US-IGY rocket program is centered at the rocket

launching facilities especially constructed for the IGY in cooperation with the Canadia Government and the Canadian IGY Committee at Fort Churchill, Manitoba, Canada. Thirt three of the 41 launchings here have resulted in good rocket performance and satisfacto data. In addition, 6 of 7 rockets fired from the same facility prior to the IGY produce satisfactory experimental data. During a single 48-hour period in January 1958, in the mid of the Arctic winter, 5 rockets were successfully launched. *Subject Headings:* **1. US/IG rocket program 2. Fort Churchill, Manitoba.**

10.5–45 550.3:061

World Warning Agency decisions October 3, 1957, January 1, 1958. *American Ge physical Union, Transactions*, 39(2):375–376, April **1958. DWB, DLC**—The IGY Wor Warning Agency is operated by the National Bureau of Standards at Fort Belvoir, Va. Th article lists several periods proclaimed ALERTS and Special World Intervals during th months of International Geophysical Year 1957–1958. The abbreviations and their meaning used, the dates and stations of different warnings are cited. *Subject Headings:* **1. IGY Wor Warning Agency 2. Fort Belvoir, Va.**—*N.N.*

10.5–46 550.3:551.506.2

Ashford, O. M., **The International Geophysical Year, 1957–58.** *World Meteorologic Organization, WMO Bulletin*, 6(3):96–99, July **1957.** fig. Also his: **International Geophysic Year.** *Ibid.*, 6(4):131–134, Oct. **1957.** Also his: **The IGY Meteorological Data Centre a work.** *Ibid.*, 7(1):2–6, Jan. **1958.** 3 photos. **DWB**—The expanded meteorological progra during IGY, the reporting of observations, and the IGY meteorological data center at Genev are described. The third paper deals more specifically with the Data Center, describing it creation, functions, the principal meteorological observations collected, details of microcard special types of observations, MDC (Met. Data Center) reports, administration and financin of this expanding and comprehensive program for accumulation, filing, recording and di seminating a huge volume of data throughout the world. *Subject Headings:* **1. IGY meteor logical program 2. IGY data centers 3. Geneva, Switzerland.**—*M.R.*

10.5–47 550.3:551.506.22(43

Olczak, T., **O udziale Polski w III Międzynarodowym Roku Geofizycznym 1957–5** [Polish participation in the IGY, 1957–58.] *Acta Geophysica Polonica*, Warsaw, 5(3):145–17 **1957.** 19 photos, ref. **DWB, DLC**—A long, well illustrated article describing the Polis IGY program, network of stations (shown for various categories of activity on a map) liste with coordinates; work of the seismic, magnetic, astronomical, oceanographic, meteorological ionospheric, sferics, astrophysical, auroral and radio propagation observatories; work of th State Hydrometeorological Institute under W. Okołowicz and the Aerological Observator at Legionorwo near Warsaw, the mountain observatory in the Tatra Mts. and on Śniezk in the Karkonoszc Mts., and a Polish aerological station in Vietnam, under direction o T. Kopcewicz, etc. *Subject Headings:* **1. Polish participation in IGY 2. IGY network 3. Polish observatories 4. Poland 5. Vietnam.**—*M.R.*

10.5–48 551.501.9:551.506.22(71

Canada. Meteorological Branch, **Canadian participation in the International Geo physical Year (IGY) program: meteorological data.** Its *CIR*-2932, OBS, 271, June 7, 195 6 p. tables. **DWB, DLC**—A list of 109 regular stations and 11 extra stations all over Canad reporting for WMO data center during IGY is appended in a directive outlining procedure for entering data on special IGY forms effective July 1, 1957. *Subject Headings:* **1. Canadia participation in IGY 2. Meteorological data forms for IGY 3. Canada.**—*M.R.*

10.5–49 551.521.3:06 551.507.362

Smithsonian Institution. Astrophysical Observatory, **Report on the Observatory, 195** From *Smithsonian Institution, Annual Report*, 1956, p. 65–74. pub. **1957. DSI.** Summar in *Nature*, London, 179(4566):100, May 4, **1957.**—Work on IGY satellite tracking, meteorit and solar radiation is summarized. (*See* 3.6–96 for 1950 Report. Also, 6A–104, for repo

vering 1941–1952.) *Subject Headings:* **1. Satellite tracking 2. Solar radiation 3. Astro-ysical observatories. I. Whipple, F. L. (Dir.).**—*M.R.*

10.5–50 551.506.22:52/526

Roelofs, R., **Delft en het internationale geofysische jaar.** [Delft in the International ophysical Year.] *Hemel en Dampkring*, The Hague, 54(11):201–204, Nov. **1956. DWB, C**—A summary of geodetic and astronomical work planned for IGY at Delft, and a list of stations in the geodetic-astronomic network for IGY. *Subject Headings:* **1. IGY astro-mical program 2. IGY geodetic program 3. Delft, Netherlands.**—*M.R.*

10.5–51 550.3:551.506.22

Chapman, S. (*High Altitude Obs., Colorado*), **The International Geophysical Year.** (In: ites, D. R. (*ed.*), **The Earth and its atmosphere,** N. Y., Basic Books, **1957.** p. 1–11.) **DLC**—n account of the aims, scope, interdisciplinary cooperation, long-term possibilities for research, story, organization and special features of IGY written before "Sputnik," and in a popular yle. *Subject Heading:* **1. International Geophysical Year, 1957–1958.**—*M.R.*

10.5–52 550.3:551.506.22

Odishaw, Hugh, **International Geophysical Year: report on the United States program.** ience, Wash., D. C., 127(3290):115–128, Jan. 17, **1958.** 14 figs. (incl. photos). Also: **A eport on the U. S. program.** *American Geophysical Union, Transactions*, 39(1):179–187, eb. **1958.** Also: R. German (*Tübingen*), **Glazialforschung im IGJ.** *Naturwissenschaftliche undschau*, Stuttgart, 11(5):189–190, May **1958. DLC**—The U. S. program for the first e months of the IGY, 1 July to 30 Nov. 1957 is primarily on the physics of the upper atmos-ere, the earth's heat and water regime, and on the earth's structure and interior. The second tegory includes subjects on meteorology. A chain of meteorological stations have been ilt for intensive weather observation. In addition, 12 nations have cooperated to establish ore than 50 scientific meteorological observatories in the Antarctic. Large neoprene balloons ve been sent to altitudes of over 80,000 ft, the average height being 60,000 ft. At 112 her non-Antarctic U. S. stations such balloons go up to 107,000 ft to radio temperature and midity back to the ground. The second and third articles are condensations of the first. *ubject Heading:* **1. U. S. participation in IGY.**—*N.N.*

10.5–53 550.3:551.506.22(47)

XX s"ezd Kommunisticheskoĭ partii Sovetskogo Soiuza i geofizicheskie nauki. [20th onvention of the Communist Party of the Soviet Union and the geophysical sciences.] *kademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 2:121–123, Feb. **1956. DLC**—The role of eophysical sciences on the economic life in the U.S.S.R. is stressed. While most of this article on the need for increased research in the geophysical sciences, mention is made of special ork in meteorology, hydrology, etc. in connection with the IGY. *Subject Headings:* **1. Geo-ysical research 2. Soviet IGY program.**—*I.L.D.*

10.5–54 550.3:551.506.22(675)

Van Straelen, V., **Le Congo et l'Année Géophysique Internationale 1957–1958.** [Congo d the International Geophysical Year 1957/1958.] *Académie Royale des Sciences Coloniales, ulletin des Séances. n. s.*, 4(2):440–447, **1958. DLC**—The author unfolds a program of ientific researches which had been planned in the Belgian Congo for the Ruwenzori and dward Lake regions. It was planned to set up climatologic stations, on the western side the Ruwenzori, spaced out from 1330 m up to 4800 m altitude. In physical glaciology, it as expected to study, through modern instrumental methods, the diurnal and seasonal riations of the balance accumulation-ablation of the glacier Ruwenzori. This study should ear up the causes of glacial recession in equatorial regions. Finally, it was planned to study e annual regime of evaporation of Edward Lake through the energy balance method. Study the energy balance of the lake and its components: global radiation, albedo, real thermic diation, surface temperature, accumulated calories, turbulent heat and vapor exchange with e air. The elaboration of this program seems however not to be workable immediately. *ubject Headings:* **1. IGY program in Belgian Congo 2. Belgian Congo.**—*A.V.*

WMO

10.5–55 551.5:06

Davies, D. A., **International co-ordination of meteorological activities: Secretary-Gener address to the 24th session of the U. S. Economic and Social Council.** *World Meteorolog Organization, WMO Bulletin*, 6(4):126–130, Oct. **1957. DWB**—Notes on the role of WM (and of IMO from 1878–1951) in advancing the interests of the member countries in mete ology, hydrology, etc. and in economic development. Part played by WMO in IGY, relati with ICAO, UNESCO and FAO, and Technical Assistance program are reviewed in t condensation of the address given at Geneva in July 1957. *Subject Heading:* **1. Internatio Meteorological Cooperation.**—*M.R.*

10.5–56 551.509.1:06

Alaka, M. A., **Meteorological transmissions in Europe.** *World Meteorological Organi tion, WMO Bulletin*, 5(2):72–74, April **1956.** photo. **DWB**—Photograph shows 35 memb of working group on Telecommunications of RAVI which met in Paris from Jan. 25 to Feb 1956 under the Chairmanship of C. V. Ockenden of the United Kingdom. Members of countries attended. Radioteleprinter broadcasts, inclusion of 150 mb and 100 mb levels upper air messages; organization of an international meteorological teleprinter network Europe, use of facsimile map transmission; and joint WMO/ICAO review of RAVI proble and requirements are discussed. *Subject Headings:* **1. Communications network conferen 2. Transmission of reports 3. Paris, France.**—*M.R.*

ARCTIC RESEARCH

See also: **IGY World Warning Agency,** 10.5–45; **Long range ice forecasting, American Arctic,** 10.5–135, –136.

10.5–57 551.506.7(

*Gaĭgerov, S. S., **K resul'tatam aerologicheskikh nabliudeniĭ na dreĭfuiushcheĭ stan "Severnyĭ polius-4" v 1955/56 g.** [The results of aerological observations on the drift stat "North Pole-4" in 1955/56.] *Meteorologiia i Gidrologiia*, Leningrad, No. 10:3–9, Oct. 19 fig., 3 tables, 7 refs. **DWB, DLC**—A preliminary analysis of the aerological observati made during the cold season of 1955/56 on the drifting station "Severnyĭ Polius-4" in central Arctic. These observations were the first to be made with a radiotheodolite and first to provide reliable data on the wind regime to considerable heights. The maxim heights of the tropopause occur during the cold period of the year, reaching heights grea than 12 km and temperatures as low as −73°C. The absolute minimum of tropopause hei and associated circulation conditions and disappearance of the tropopause are discussed. the lower stratosphere, the maximum temperature in the summer has a value of about − to −30°C; and it increases with height; during the winter the temperature in the lower stra sphere diminishes with height. A graph showing the distribution of temperature with hei at "SP-4" is presented. The discussion includes the seasonal variation of temperature in lower stratosphere with height, the role of ozone in the rise in the temperature of the lo stratosphere, the relation of temperature change to solar altitude, wind velocities in the up troposphere, inversions in the central Arctic, etc. Data are presented on the extreme te perature values at various heights according to radiosonde data of various drifting statio extreme heights and temperatures of the tropopause and of inversions, and isothermy in lower layer of the atmosphere. *Subject Headings:* **1. Upper air data 2. Tropopause d 3. Upper air temperatures 4. Arctic.**—*I.L.D.*

10.5–58 551.583.2:551.311.1(9

Georgi, J. (*Hamburg*), **Temperatur- und Dichtemessungen des grönländischen landeises.** [Temperature and density measurements of the Greenland Ice Cap.] *Ann de Géophysique*, Paris, 12(1):102–110, Jan./March **1956.** 2 figs., 12 refs. French and Eng summaries p. 102. At head of article: **Rapports Scientifiques des Expéditions Polai Françaises, N IV 4. DLC**—Compares ice temperature and density measurements made Heuberger near Eismitte down to a depth of 150 m in 1950 with measurements made

RGE to 16 m in 1930. SORGE's results, showing a temperature decrease with depth, are lly confirmed, indicating a gradual warming in the climate since 1800 up to 1920. SORGE's w for the density profile also was substantially confirmed. Author proposes to perform peated measurements every five years at selected locations. *Subject Headings:* **1. Climatic riations 2. Ice density measurements 3. Eismitte, Greenland.**—*A.A.*

10.5–59 551.311.17(988)

Brockamp, B., **Seismische Beobachtungen des grönländischen Inlandeises.** [Seismic servations on the Greenland Ice Cap.] *Frankfurt a.M. Universität. Meteorologisch-eophysikalisches Institut, Bericht*, No. 6:18–24, **1956.** 2 tables, 11 refs. **DWB?**—By means seismic reflection and refraction methods, the thickness of glaciers and of the ice cap can be termined. The maximum thickness of the Greenland Ice Cap is 3400 m so that the Greenland Ice Cap has a water content amounting to 3×10^6 km³. The relief of the subsurface copied by the flowing glacier ice and is reflected in the ice surface. At the margin of the reenland Ice Cap, the subsurface relief reflects itself in a ratio of 1–7 when the ice thickness is 00 to 600 m. The ice of the Alps (temperature 0°C), Greenland Ice Cap (marginal area 6°C at 6 in., −16° at 60 km from margin), etc. indicate that the morphology of the surface is flected at thickness from 200 to above 1000 m. The application of seismic procedures to aking a reliable map of the rocky subsurface is briefly described, and its use in determining ie changes of thickness in the Greenland Ice Cap is indicated. The rate of propagation of ngitudinal and of transverse waves is associated with specific ice temperatures. Data on e temperatures at various thicknesses of Alpine glaciers, at Vatna Jökul on Iceland, etc. are ven. Temperatures on the Greenland Ice Cap corresponding to various wave velocities in ie ice are presented. The influence of friction, resulting from the motion of glacial ice, pon glacier temperature is discussed. *Subject Headings:* **1. Greenland Ice Cap 2. Ice ickness measurement techniques 3. Greenland.**—*I.L.D.*

ANTARCTIC RESEARCH

10.5–60 551.506.5(99)

*Prudhomme, André and Valtat, B., **Les observations météorologiques en Terre Adélie 950–1952.** [Meteorological observations in Adélie Land, 1950–1952.] *Expéditions Polaires rançaises, Expéditions Antarctiques, Résultats Scientifiques, [Unnumbered Report], Ser. S Antarctic), V (Météorologie)*, pub. Paris **1957.** 179 p. 26 figs., 49 tables, 65 refs. English nd German summaries p. 175–177. On cover: Direction de la Météorologie Nationale de rance. **DWB**—The observations made by French meteorologists at Port-Martin and ointe Géologie in Adélie Land from Feb. 14 to Dec. 31, 1952 are compared with the results earlier and simultaneous Antarctic expeditions. This study falls into four quite distinct arts: 1) An analysis of surface data gathered at Port-Martin not only shows classical Antctic characteristics but also peculiarities due mainly to the extraordinary force of the winds nd the remarkable density of snow-drift, which are the dominant climatological features of is part of Antarctica. 2) An analysis of the observations at high altitude made at Port-Iartin shows that the vertical wind and temperature distribution over the Adélie Land coast resents most of the aspects found in other series of soundings in other years near the fringe the polar continent. Some divergencies in the results concern, in the main, the lowest yers which are influenced by the katabatic storms that are more violent here than in other arts of Antarctica: in this series also the winter disappearance of the tropopause could not be nfirmed. 3) A brief interpretation of the data obtained on journeys in 1951 and at Pointe éologie in 1952 proves the presence of important meridional lapse-rates of the meteorological ements between the inland ice and the ocean. 4) Synoptic considerations, partly theoretical nes, but based mainly on simultaneous observations at Port-Martin and on Macquarie land, show that meteorological developments over the Antarctic continent may produce a nsiderable effect on the wind system of the Adélie Land coast. The precise origin and ture of the specifically Antarctic perturbations could not be elucidated but the analysis the data suggests that their influence undergoes an important yearly fluctuation as a function the nature and quantity of sea-ice in the southern part of the Indian Ocean. *Subject Headgs:* **1. Antarctic expeditions 2. Expeditionary data 3. Expéditions Polaires Françaises Adélie Land, Antarctica.**—*Authors' abstract.*

10.5–61 551.582.1(

*†Meinardus, W., **Klimakunde der Antarktis.** [Climatology of the Antarctic.] *Handb der Klimatologie*, Berlin, Vol. 4, Teil U, **1938.** 133 p. 23 tables, foót-refs., bibliog. p. 128–1 **DLC** (QC981.H22 Vol. 4, R-S-T-U)—Climatic data for various stations in the Antarctic compiled from various sources and tabulated. *Subject Headings:* **1. Climate of Antarct 2. Antarctica.**—*G.T.*

10.5–62 551.506.5:691.77(

Tabuteau, François, **Rapport sur l'emploi du métal léger dans les expéditions antarctiqu Françaises.** [Report on the use of light metal in the French Antarctic Expeditions.] Pa Année Géophysique Internationale. Sous-Comité Antarctique Français, **1956.** 21 p. figs. (incl. photos). **DWB**—In order to make optimum use of the limited weight which c be loaded, unloaded and transported to and on the Antarctic continent while setting up ba at Point Géologie on the edge of Adélie Land, and at a point 250 mi south of the Icecap, t French IGY expedition of 1956 and preliminary missions have made use of equipment c structed almost entirely of light weight alloys of aluminum. Some of the equipment is ill strated with beautiful black and white and color photographs. Hydrogen cylinders, sledg snow-cats, doors, masts, scientific equipment, kitchen utensils, fuel tanks, markers—in fa almost everything at the interior station—are covered. Experiences during the 1950– operations are related to the more limited and the expected experience with light metal c struction and equipment. *Subject Headings:* **1. Antarctic station equipment 2. Light me equipment 3. Expédition Polaires Françaises 4. Point Géologie, Adélie Land, Antarcti** —*M.R.*

10.5–63 551.524.7:551.510.53:551.587(9

Bannon, J. K. (*Met. Office, Harrow, Middlesex*), **Stratospheric temperatures over t Antarctic.** *Royal Meteorological Society, Quarterly Journal*, 84(362):434–436, Oct. **195** 2 figs., table, 10 refs. **DWB, DLC**—Some recent observations together with data from earl expeditions (COURT, 1942; SCHUMACHER, 1955 and others) suggest that the annual variati of temperature in the stratosphere over the Antarctic is characteristically asymmetric with steep rise of temperature in the spring. This is probably not general over the Arctic. T tropopause over the Antarctic is significantly higher than over the Arctic in their respecti winters and the variability of temperature in the lower stratosphere appears to be considerab less in the same season over the Antarctic than over the Arctic. *Subject Headings:* **1. Strat spheric temperatures 2. Antarctica.**—*Author's abstract.*

10.5–64 550.38(9

Nagata, T. and Oguti, T. (*both, Geophysical Inst., Tokyo Univ.*) and Momose, K. (*Facul of Liberal Arts, Sinsyu Univ.*), **Preliminary report of geomagnetic observations at Prin Harald Coast, Antarctica.** *Japan. Science Council. Ionosphere Research Committee, Rep of Ionosphere Research in Japan*, 11(2):41–49, June **1957.** 3 figs., 2 tables, 7 refs. **DWB** The results of geomagnetic observation at Prince Harald Coast during the first Japane Antarctic Research Expedition (1956/57) are briefly summarized. The geomagnetic tot intensity around this region was found to be about 10% less than the value in the world-wi map by E. H. VESTINE. Correlation between the geomagnetic phenomena and ionospher ones, and some characteristics of geomagnetic pulsations are discussed. *Subject Heading* **1. Geomagnetic observations 2. Japanese Antarctic Research Expedition, 1956–57 3. Prin Harald Coast, Antarctica.**—*Authors' abstract.*

SERVICES AND SOCIETIES

See also: **Polish and Yugoslav weather services** (Bulavko), 10.5–77.

10.5–65 551.5:3

Rojecki, Ananiasz (*Warsaw*), **Materiały dotycazce organizacji szkolenia specjalist w zakresie nauk geofizycznych ze szcególnym uwzględnieniem meteorologii, [Pt. 2].** [M

al pertaining to the organization of instruction of specialists in the fields of geophysical ence with special attention to meteorology, Pt. 2.] *Przegląd Geofizyczny*, Warsaw, 1(1):49– **1956.** 2 tables. **DLC**—Contains detailed information on the organization and the gram of special education in the Ecole de la Météorologie which prepares skilled workers, ineers, meteorologists, technicians and technical aides for the French Meteorological vice. *Subject Headings:* **1. Meteorological education 2. French meteorological service.** *I.M.P.*

10.5–66 551.579:061.1(73/9)

Muranov, A. P., **O gidrologicheskoĭ sluzhbe v Soedinennykh Shtatakh Ameriki.** [The lrological service in the U.S.A.] *Meteorologiia i Gidrologiia*, No. 2:56–59, Feb. **1957.** 2 refs. **DWB, DLC**—An account of the development and scope of the hydrological k carried on by the Geological Survey and the U. S. Weather Bureau. A map showing the drological regions of the U. S. (conforming to the hydrological yearbook of the Geological rvey) is reproduced. The contents of the yearbook and of other publications are described. *bject Headings:* **1. Hydrologic services 2. United States.**—*I.L.D.*

10.5–67 551.579:061.1(09)(439.1)

Muranov, A. P., **Gidrologiia v Vengerskoĭ Narodnoĭ Respublike.** [Hydrology in Hun- y.] *Meteorologiia i Gidrologiia*, Leningrad, No. 12:47–50, Dec. **1957. DWB, DLC**—A tory of hydrology in Hungary since its beginning in the 1820's up to the present. The t water measuring stations on the principal rivers of Hungary were established in 1823, but tween 1818 and 1840 a topographic survey of the principal rivers was carried out to the scale 1:3600 and 1:7200. The laws of the distribution of velocities in a current along the vertical re worked out by P. VÁSÁRHELYI whose investigations preceded by 16 yrs the similar work HUMPHREYS and ABBOT, published in 1861. In 1886 the Hungarian hydrological service s established. Up until 1902 it was engaged primarily in the study of floods and means preventing them, regulation of rivers, and collection of hydrological data. From 1902, en I. PETSCH became the director, a network of hydrological stations was organized, an ormation service was established, hydrological forecasts were worked up and various im- rtant hydrological publications began to be issued. A state of stagnation occurred during e period 1903–1920. During this period a survey of the water resources of the Danube sin was carried out. During 1920–1940 governmental interest in hydrology and its scientific oblems developed. The hydrographic section was replaced by a Hydrographic Institute in e Ministry of Agriculture. Research did not progress in this period, but in 1930 the Hydro- gical Yearbook began publication and various surveys of rivers were issued between 1936 d 1944. Since 1945 the work in hydrology has been intensified, especially in connection th the establishment of a scientific institute on water economy. This institute controls the drological network and engages in the collection of data on surface and ground water, etc. ne scientific activity of the institute includes systematization of hydrological observations, udies of means of flood protection, irrigation studies, deformation of river channels, studies the ice regime of rivers, etc. *Subject Headings:* **1. History of hydrology 2. Hungarian ydrological Service 3. Hydrologic networks 4. Hungary.**—*I.L.D.*

10.5–68 551.5:63:061.6

Okushko, A. A., **V sektsii sel'skokhoziaĭstvennoĭ meteorologii VASKHNIL:** [In the gricultural Meteorology Section of the Lenin All-Union Academy of Agricultural Sciences.] *eteorologiia i Gidrologiia*, Leningrad, No. 8:72–73, **1957. DWB, DLC**—Early in 1957 a ction on agricultural meteorology and agroclimatology was organized in the Lenin All-Union cademy of Agricultural Sciences. F. F. DAVITAIA is the chairman of the section which is mprised of 94 members, including meteorologists, hydrologists, agricultural climatologists, ysiologists, soil scientists and other specialists from allied fields. This note contains a mmary of the aims of this section, and of the proceedings of the first meeting held on May 27, 57, at which a number of scientific papers were delivered. The papers delivered and the dividual discussing them are mentioned. *Subject Headings:* **1. Agrometeorological services U.S.S.R.**—*I.L.D.*

10.5–69 551.5:061.1(

Bulavko, A. G., **Minskomu biuro pogody 25 let.** [25 years of the Minsk Weather Bure *Meteorologiia i Gidrologiia*, Leningrad, No. 9:68, Sept. **1956. DWB, DLC**—The M Weather Bureau was established in 1931. It broadcasts weather reports 29 times a Spring flood forecasts are made for 27 points in Byelorussia. A brief description of the activ of the Belorussian Weather Service is given. *Subject Headings:* **1. Weather broadcas 2. History of Minsk Weather Bureau 3. Minsk, Byelorussian S.S.R.**—*I.L.D.*

10.5–70 551.5:0

Tu, Chang-Wang, (*Cent. Met. Office, Chinese People's Repub.*), **O nauchno-issledovatel' rabote v oblasti meteorologii v Kitae.** [Scientific research in the field of meteorolog China.] *Meteorologiia i Gidrologiia*, Leningrad, No. 11:3–7, Nov. **1956. DLC**—A ge review of progress in the field of meteorology in China deals primarily with development Communist China. Research is carried out on typhoons, torrential rains, frosts, cold wa etc.; the network has been expanded and synoptic studies have been carried out on the tinental anticyclone, low pressure formation in southern China, anticyclone of the eas China Sea, etc.; a center of synoptic analysis and forecasting was organized in 1952 by Chinese Academy of Science and the Central Meteorological Observatory; long range f casting on the basis of the methods of B. P. MULTANOVSKIĬ and S. T. PAGAVA is carried the large circulation of the atmosphere over East Asia, etc. is studied. The author ad that up to now the level of scientific research in meteorology is not very high. *Subject H ings:* **1. Meteorological research 2. Progress in meteorology 3. China.**—*I.L.D.*

10.5–71 551.5:061.1

Kashin, K. I., **20-letie Tsentral'nogo Instituta Prognozov.** [20th anniversary of Central Forecasting Institute.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy*, 55:3–11, **1957. DLC**—A review of the research that has been carried out in the Cen Forecasting Institute since its founding in 1936. The various problems of meteorology have been and are being investigated are described briefly, and the contributions of the var members of the institute are cited. Since its founding in 1936, in order to provide short ra weather and hydrological forecasts and to serve agriculture, the Institute has always car out extensive research in various aspects of meteorology. These began with the develop of front analysis with special reference to the territory of the U.S.S.R., the utilization of a logical data in making short range forecasts, and the introduction of pressure topogra maps into synoptic meteorology and forecasting pressure fields. In 1940 the Central A logical Observatory was established. Considerable work was carried out on the applica of hydrodynamic methods, based upon the work of I. A. KIBEL' on short and long ra forecasting. In 1948, a special section for aviation meteorology was established. In 1954 the Institute published **Handbook for making short range weather forecasts** in which various procedures used were presented. Special long range forecasts, based upon modifica of MULTANOVSKIĬ's method by PAGAVA, are attempted and various procedures on objec forecasting are being developed. A section of forest fire forecasting was established in 1 Extensive research is being carried out on hydrological forecasting, including computa and forecasting, on spring floods and the role of snow melt, water retention of snow and un snow cover upon spring floods, on rate of infiltration of water into the ground, long ra forecasts of river freeze and break up, etc. In the field of agricultural meteorology, t books have been issued for forecasting the development of phases and moisture supplie agricultural crops, agrometeorological handbooks have been compiled, etc. *Subject Head* **1. U.S.S.R. Central Institute of Forecasting 2. Meteorological research 3. Histor observatories 4. Weather forecasting 5. U.S.S.R.**—*I.L.D.*

10.5–72 551.5:061.1

Khraborov, Iu. B., **20 let operativnoĭ raboty v oblasti prognozov pogody Tsentral'n Instituta Prognozov.** [20 years of operational activity in the field of weather forecastin the Central Forecasting Institute.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy*, 55:23–34, **1957. DLC.** Trans. **DWB** (M(06) K4Stw)—The author gives an histo account of the organization of the Central Institute of Forecasting of the U.S.S.R. in Mos

930 and reviews its activities, particularly the operational work for the national economy, until the establishment of the Central Forecasting Institute in 1936. In 1937 synoptic s for the Asiatic part of the U.S.S.R. for four daily periods, and charts of baric topography, began to be constructed. After the war the forecasting activities of the Institute in- sed considerably. Sections on aviation meteorology and on forest fire forecasting were blished. Increasing numbers of synoptic maps were prepared, including pressure topog- y charts for high altitudes for the entire Northern Hemisphere, and the **Handbook for t range weather forecasting** was issued. Three-day forecasts began to be made in 1937 in 1940 **Foundation of the synoptic method of long range forecasting,** by T. A. DULETOVA, . PAGAVA et al., was published. In 1956 long range forecasts were based upon the fore- ing of extreme temperatures of synoptic seasons. The time required for constructing range monthly forecasts was reduced. This article contains details on the development ng range forecasting, its reliability, the nature of short and long range forecasts provided national economy, shipping, aviation, etc. Also the names of individual meteorologists, ciated with the operational work of the Institute, are mentioned and the size of personnel aged in various activities is indicated. *Subject Headings:* **1. U.S.S.R. Central Institute orecasting 2. Weather forecasting 3. U.S.S.R.**—*I.L.D.*

10.5–73 551.5:551.579:061.1(47)(09)

Gidrometeorologicheskaia sluzhba SSSR k sorokaletiiu Velikoĭ Oktiabr'skoĭ sotsialisti- skoĭ revoliutsii. [The Hydrometeorological Service of the U.S.S.R. on the 40th anniversary the Great October Socialist Revolution.] *Meteorologiia i Gidrologiia*, Leningrad, No. 3–6, Nov. **1957. DWB, DLC**—An account of the expansion of the hydrometeorological vice in the U.S.S.R. since the October Revolution. In 1914 there were in Russia 1416 teorological stations, 1480 meteorological posts, 1134 observation points on river level, observation points on river flow, 61 marine hydrometeorological stations and 60 marine drometeorological ports. These were almost entirely destroyed during its Civil War period. 1929 a unified hydrometeorological service was established. In 1929 a radiosonde network an to be organized, and in 1929–1930 the National Hydrometeorological Institute and the ntral Geophysical Observatory were transferred to the hydrometeorological service. Be- en 1930–1940 the Central Weather Bureau (later Central Institute of Forecasting), the ntral Aerological Observatory, and various educational institutions were organized. During Second World War the hydrometeorological service suffered considerably (3897 stations d ports were destroyed). At present the service has 10,000 stations and ports and 600 titutes. A general discussion of the economic and scientific role of the hydrometeorological vice, the introduction of new techniques (electronic high speed calculators, radioisotopes, .), etc. are presented. *Subject Headings:* **1. U.S.S.R. Hydrometeorological Service 2. His- y of hydrometeorological services 3. Networks 4. U.S.S.R.**—*I.L.D.*

CONFERENCES AND SYMPOSIA

See also: **Astrophysics conf. 10.5–1 and 10.5–2; Comm. networks conf., Paris, France** (Alaka), 10.5–56.

10.5–74 551.5:63:061.3(584.6)

Zakharov, V. N., **Soveshchanie v Kazakhstane.** [Meeting in Kazakhstan.] *Meteoro- iia i Gidrologiia*, Leningrad, No. 3:67–68, March, **1957. DWB, DLC**—Report of a meeting d in Alma-Ata during Dec. 25–26, 1956 on the results of research on the water and agro- matic conditions of the virgin and fallow lands of Kazakhstan. Some of the reports pre- ted included studies on the surface waters of the Akhmolinsk, Kokchetansk and Kustanai lasts (P. P. VORONKOV), agroclimatic studies by L. A. RAZUMOV, I. A. GOL'TSBERG, A. P. DOSEEV and A. D. KOPYT. *Subject Headings:* **1. Agrometeorological conferences 2. Cli- te of Kazakh SSR 3. Kazakh SSR.**—*I.L.D.*

10.5–75 551.5:061.3

Australian and New Zealand Association for the Advancement of Science, **Papers read to ction A, Astronomy, mathematics and physics, including optometry, of the 32nd Meeting,**

Dunedin, N. Zealand, Jan. 16–23, 1957. *Australian Journal of Science*, Sydney, 19(3):P P26, Jan. **1957.** Also: Australian and New Zealand Association for the Advancement Science, **Abstracts of papers of meteorological interest presented at A.N.Z.A.A.S. Confere Dunedin, New Zealand, January 1957.** *Australian Meteorological Magazine*, Melbou No. 16:33–44, March **1957. DWB**—First article lists scientific papers read to Sec. A of Australian and New Zealand Association for the Advancement of Science, Jan. 16–23, 1 Twelve meteorological papers are included. Second article contains abstracts or long su maries of the meteorological papers presented at the conference. Three of the papers are Australians and 9 by New Zealanders. *Subject Headings:* **1. A.N.Z.A.A.S. Conference, Du din, N. Z., Jan. 1957 2. Science congresses.**—*N.N., M.R.*

EDUCATION, HISTORY AND BIOGRAPHY

EDUCATION AND RESEARCH

See also: **Progress in met., China** (Tu), 10.5–70; **Met. research, Frankfurt a.M.** (Möller, Wachter), 10.5–83.

10.5–76 551.5:061.6 550.3:0

U. S. National Science Foundation, **Federal grants and contracts for unclassified resea in the physical sciences, Fiscal year 1955.** Issued Nov. **1955.** 115 p. "First of a seri Also: 1956 edition, issued April **1956.** 138 p. **DWB** (540794 U586fe)—Of the $60–70 mil in research contracts awarded in 1955 and 1956 by the U. S. Government to various U and a few foreign institutions, the projects, chief investigators and institutions receiv grants in meteorology, climatology, oceanography and upper atmospheric physics are lis with total (in thousands of dollars) as follows:

	1955	*1956*
Geophysics	1,757	1,800
Oceanography	1,315	1,656
Met. and Climatology	1,864	1,705
Total	4,936	5,161

or about $5 million a year. This includes unclassified Army, Navy, Air Force, NSF and sc departmental contracts. It does not include grants for studies in physics or cosmic ra *Subject Headings:* **1. Research grants in meteorology 2. Research grants in geophysics.**—*M*

10.5–77 551.5:06

Bulavko, A. G., **Meteorologiia i gidrologiia za rubezhom.** [Meteorology and hydrol abroad.] *Meteorologiia i Gidrologiia*, No. 10:71–72, Oct. **1956. DWB, DLC.** Transl. i English (6 p.) available for reference. **DWB** (M B933me)—Brief notes on organizatio activities on meteorological education, various developments and expansions in the weat services of Poland and Yugoslavia during 1955 and 1956. *Subject Headings:* **1. Polish weat service 2. Yugoslav weather service 3. Training in meteorology.**—*I.L.D.*

10.5–78 551.5:378(02):8

Istanbul. Technical University, **Meteorological Training Course, 1954–1955.** 7 mim graphed looseleaf pamphlets, most of them trans. into Turkish from original English, by eit Cemal Bergen or Abdurrahman Kurun. figs., tables. At head of each cover page: T. Başvekalet Devlet Meteoroloji Iş. Um. Md. Contents: Teweles, Sidney, Jr. and Neuberg Hans H.: **Aeoronotik ve sinoptik meteoroloji.** [Aeronautical and synoptical meteorolog Issued **1956.** 127 p. **DWB** (M(07) T354ae). Teweles, Sidney, Jr. and Neuberger, Hans **Sinoptik labratuvar calismalarinda bazi esaslar.** [Some fundamentals for work in the synop laboratory.] Pub. **1956.** (23)+13 p. **DWB** (M(07) T354si). Neuberger, Hans H. a Teweles, Sidney, Jr.: **Istatistigin meteorolijide tatbikati.** [Applications of statistics in m teorology.] Pub. **1955.** 23 p. **DWB** (M(07) N478is). Neuberger, Hans H. and Tewe

ney, Jr.: **Klimatoloji: kurs notlari.** [Notes on a climatology course.] Pub. **1955.** 29 p. nd in same cover with this title, their: **Climatology** (English version). Issued **1956.** 27 p. h **DWB** (M(07) N478cL). Teweles, Sidney, Jr.: **Iklim: kurs notlari.** [Notes of a course limate.] Pub. **1957.** 17 p. **DWB** (M(07) T354ik). Neuberger, Hans H. and Teweles, S.: **teorolojive ait aletler ve rasat notlari (kurs notlari).** [Meteorological instruments and ervations (lecture notes).] Issued **1957.** 41 p. Bound in same covers, their **Meteoro-cal instruments and observational methods** (English version). Pub. **1957.** 37 p. Both, **7B** (M(07) N478me). Inan, Msutafa (comp.): **Meteoroloji.** [Meteorology.] Ankara, **7.** 36 p. Mimeo. **DWB** (M 135me)—The present series of texts or teaching aids com-d by the two main authors during a training course at the Istanbul Technical University in 4–55 and translated into Turkish, comprise 8 separate publications of varying size and or. The first volume covers synoptic meteorology and aerology (radiation budget, com-ition of atmosphere, structure, winds, fronts, cyclones, hurricanes, thunderstorms, tur-ence, etc.); the second is a laboratory manual for synoptic analysis, the third covers sta-ics, vectors, normal distributions, smoothing, probability, etc.), vols. 4 and 5, climatology English and Turkish editions) and vol. 6, instruments and methods of observation. *Subject dings:* **1. Training courses in meteorology 2. Meteorology textbooks 3. Translations. Kurun, Abdurrahman** (*trans.*) **II. Bergen, Cemal** (*trans.*) **III. Turkey. Devlet Me-roloji Işleri Umum Mürülügü.**—*M.R.*

10.5–79 551.58:374

Neuberger, Hans H. and Teweles, Sidney, Jr., **Climatology: lecture notes from lectures sented in Meteorological Training Course at Istanbul Technical Univ., 1954–1955, Istanbul.** kara, **1956.** 27 p. tables, figs. Mimeo. Bound in the same covers: transl. into Turkish Cemal Bergen, as **Klimatoloji: kurs notlari, 1955.** 29 p. tables, figs. Both, **DWB** (07) N478cL)—The published lecture notes on climatology contain 21 chapters, dealing h radiation, temp., lapse rate, exchange, continentality, interdiurnal temp. changes, land sea breezes, mountain and valley winds, monsoon winds, meridional exchange, ocean rents, evaporation, clouds, fog, precip., cooling power, thunderstorms, regional influences, ocessing climatic data, and climatic zones. *Subject Headings:* **1. Climatology 2. Training urse in meteorology. I. Bergen, Cemal** (*trans.*).—*M.R.*

10.5–80 551.501.1:551.508:374

Neuberger, Hans H. and Teweles, S., **Meteorological instruments and observational thods. Lecture notes from lectures presented in the Meteorological Training Course at anbul Technical University 1954–1955.** Ankara, **1957.** 37 p. figs., eqs. Mimeo. "Pub-ed by the General Directorate of the Turkish State Meteorolo-Service." Bound in same vers: Transl. into Turkish by Cemal Bergen, as **Meteorolojive ait aletler ve rasat notlari urs notlari).** 41 p. figs., eqs. Mimeo. At head of cover: T. C. Başvekalet Devlet eteoroloji Iş. Um. Md. Both, **DWB** (M(07) N478me)—The training course covers: 1) sta-ns and observers, 2) recording observations, 3) cloud observations, 4) visibility, 5) hydro-eteors, 6) temperature, 7) humidity, 8) wind, 9) precipitation, 10) dew and evaporation,) sunshine recorders and 12) pressure. Instruments discussed are illustrated by drawings both English and Turkish editions. *Subject Headings:* **1. Meteorological instruments Observation techniques 3. Training courses in meteorology. I. Bergen, Cemal** (*trans.*). *M.R.*

10.5–81 51:551.5(02)

Neuberger, Hans H. and Teweles, Sidney, Jr., **Mathematics for the meteorologist: lecture tes** [from a course in the Meteorological Training Course at the Istanbul Technical Uni-rsity, 1954–1955, Istanbul]. Ankara, **1956.** 42 p. figs., eqs. Mimeo. Bound with this: nsl. into Turkish by Cemal Bergen, as **Meteorologist için matematik.** Ankara, **1955.** At ad of cover: T. C. Başvekalet Devlet Meteoroloji Iş. Um. Md. **DWB** (M(07) N578mec)—sic concepts of algebra, logarithms, trigonometry, analytics, differential and integral calculus, d theory of functions as applied to meteorology and climatology are briefly outlined, with mples, in this training manual. *Subject Headings:* **1. Mathematics for meteorologists Turkish language. I. Bergen, Cemal** (*trans.*)—*M.R.*

HISTORY

See also: **Weather broadcasting, Minsk** (Bulavko), 10.5–69; **Weather forecast., U.S.S.R.** (Kashin), 10.5–71; **Weather forecasting, U.S.S.R.** (Khraborov), 10.5–72; **Hydromet. services and networks, U.S.S.R.,** 10.5–73.

10.5–82 551.577.38(47)

Buchinskiĭ, I. E., **O zasukhakh na Russkoĭ ravnine za poslednee tysiacheletie.** [Droug on the Russian Plain in the last millenium.] (In: Akademiia Nauk SSSR. Institut G grafii, **Sukhovei ikh proiskhozhdenie i bor'ba s nimi.** Moscow, **1957.** p. 29–34. 14 re **DLC** (QC940.R9A6)—The author presents a list of drought years mentioned in anc chronicles for the period 994–1774, as well as some information on droughts mentioned literature from 1885 to 1946. *Subject Headings:* **1. History of droughts 2. Historic droug 3. U.S.S.R.**—*A.M.P.*

10.5–83 551.5:061.6

Möller, F. and Wachter, H., **50 Jahre meteorologische Tätigkeit des Physikalisch Vereins und der Universität Frankfurt a.M.** [50 years of meteorological activity of Physical Association and of the University of Frankfurt a.M.] *Frankfurt a.M. Univers Meteorologisch-Geophysikalisches Institut, Bericht,* No. 6:3–10, **1956.** 12 refs. **DWB** Meteorological observations began in Frankfurt a.M. in 1756. In 1906 a meteorolog section was formed in the Physical Association which became in 1914 the nucleus of the pres meteorological institute (Universitäts-Institut für Meteorologie und Geophysik). activities of the Institute in promoting industrial and aviation meteorology (the latter be in 1909 under the impetus of F. Linke), and meteorological education are described. detailed account is given of the special meteorological research carried out at the Instit since its founding. These institute studies on the free atmosphere, Stüve's work thermo-cyclogenesis, long range forecasting (F. Baur), radiation (Linke) and bioclimatolo in particular medical meteorology, and the scope of present research, at the institute are scribed briefly. *Subject Headings:* **1. Meteorological societies 2. Meteorological researcht stitutes 3. History of meteorology 4. Frankfurt a.M., Germany.**—*I.L.D.*

10.5–84 551.508.822

Vukmirović, D., **Jedna značajna tridesetogodišnjica.** [An important thirtieth an versary.] *Yugoslavia. Hidrometeorolška Služba, Vesnik,* 6(1/2):56–58, Jan./June 19 fig., 3 refs. **DWB**—On March 3, 1957, P. Idrak and R. Biro launched the first success balloon-borne short-wave transmitter in France. This was not a radiosonde launching sometimes erroneously stated in the literature), as no meteorological measurements w involved. The first radiosonde measuring temperature was launched on Jan. 7, 1929 R. Biro and the first sonde measuring all elements by Molchanov on Jan. 30, 1930 at P lovsk. *Subject Heading:* **1. History of radiosonde.**—*G.T.*

10.5–85 551.5(09)(4

Maňák, Jaroslav, **Kus historie Československé meteorologie.** [A bit of Czechoslov meteorological history.] *Meteorologické Zprávy,* Prague, 11(1):25–26, **1958.** photo. **DWB** After 38 yrs as a meteorological observer at České Budějovice (and Litvínovice), the auth recalls a few details of his activities, of the history of his station, and of the development meteorology in Czechoslovakia. *Subject Headings:* **1. History of Czechoslovak meteorol 2. Czechoslovakia.**—*G.T.*

10.5–86 551.506:551.524(09)(7

†Havens, James M. (*Bedford College, Univ. of London*), **A note on early meteorologi observations in the United States with reference to the Germantown temperature record 1731–32.** *American Meteorological Society, Bulletin,* 39(4):211–216, April **1958.** 3 tabl 25 refs., 2 eqs. **DWB, DLC**—Following an historical sketch of meteorological records kno to have been kept in Colonial America prior to 1740, the earliest instrumental readings temperature in North America capable of approximate reduction to present-day standar those recorded at Germantown, Pa., are examined in detail. A scale correction for the primit

renheit thermometer used is derived from two independent methods; when uniformly lied to the observed readings, reasonable values of monthly mean temperatures are shown Dec. 1731 to Oct. 1732. *Subject Headings:* **1. Historic temperature records 2. German-n, Pa.**—*Author's abstract.*

10.5–87 551.508.43(09)

Chilton, D., **The British clockmakers' heritage.** *Weather*, 7(8):252–253, Aug. **1952.** lates, ref. **DWB**—Description and photo of a clock barograph made for GEORGE III in 5. A similar one made in 1766 was acquired by LUKE HOWARD. *Subject Heading:* **Barographs.**—*C.E.P.B.*

10.5–88 551.506(09)(438)

†Rojecki, Ananiasz (*Warsaw*), **O najdwniejszych obserwacjach meteorologicznych na miach polskich (kommunikat wstepny).** [The oldest meteorological observations in ish territory: preliminary report.] *Przegląd Geofizyczny*, Warsaw, 1(3/4):253–257, **1956.** le, 18 refs., eqs. French summary p. 257. **DWB, DLC**—On the occasion of the 300th niversary of the making of the first instrumental meteorological observations by the Floren-e Society, the author has compiled some data on the earliest observations in Poland, made about 30 stations before the end of the 18th century. Continuous noninstrumental ob-vations go back to 1525–40 (Olkusz, 50°17′×19°32′), although sporadic observations were de at Kraków in 1490 and systematically in 1525–40. Oleśnica had 62 yrs of unbroken ord (1536–97) and instrumental observations were made at Warsaw and Gdańsk (Danzig) m 1647 and 1655, respectively, while at Wrocław observations began in 1692. KEPLER made ervations at Zagan from 1628–30. At that place instrumental observations were made the Palatine Society in 1781–92. *Subject Headings:* **1. History of meteorological observa-ns 2. Poland.**—*M.R.*

BIOGRAPHY

See also: **Man from the hurricane** (Jones), 10.5–126.

10.5–89 551.5:92

Van Mieghem, J., **Carl-Gustaf Rossby in memoriam (1898–1957).** *Archiv für Meteoro-ie, Geophysik und Bioklimatologie, Ser. A*, 10(4):426–428, **1958.** Also his: **[Obituary of] rl-Gustaf Rossby, President [of International Association of Meteorology and Atmospheric ysics), 1954–1957.** *I.U.G.G. Association of Meteorology and Atmospheric Physics, 11th sembly, Toronto, Sept. 1957, Reports of Proceedings*, pub. London, May **1958.** p. 1–3. o: **Obituary** by H. R. Byers, *Ibid.*, p. 4–6. Also: Sheppard, P. A., **[Obituary of] Prof. G. Rossby.** *Nature*, London, 180(4596):1166, Nov. 30, **1957.** Also: **[Obituary note on G. Rossby].** *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 6:800, **1958.** Also: ancini, R., **Alcune opinioni di Rossby.** [Some opinions of Rossby.] *Rivista di Me-rologia Aeronautica*, Rome, 18(1):50–51, **1958.** Also: Đurić, Dušan, **Karl-Gustav Rosbi, 98–1957.** *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 6(3/4):169–171, July/Dec. **1957. VB.** Also: Bolin, B., **[Obituary note on Carl-Gustaf Rossby].** *Akademiia Nauk SSSR, estiia, Ser. Geog.*, No. 3:140–141, **1958. DLC.** Also: Bergeron, Tor, **Carl-Gustaf Rossby: innesteckning.** [Obituary of C.-G. Rossby.] *Vitenskaps-Societeten, Uppsala, Årsbok*, **58.** p. 17–23. Reprinted in *Uppsala. Universitet. Meteorologiska Institutionen, eddelande*, No. 59, **1958.** Also: Byers, H. R., **[Obituary sketch of] Carl-Gustaf Arvid Rossby.** *nerican Philosophical Yearbook 1958:* 136–139, pub. **1959. DWB, DLC**—CARL-GUSTAV VID ROSSBY, Director of the Inst. of Meteorology, Univ. of Stockholm, died Aug. 19, 1957 the age of 59. He was born Dec. 28, 1898 in Stockholm, worked with V. BJERKNES at rgen and entered the Swedish Meteorological and Hydrological Service in 1922. He visited e United States in 1926 under sponsorship of the Swedish-American Foundation, established e Dept. of Meteorology at Mass. Inst. of Tech. where he was head from 1928–1939, and the st. of Meteorology at the Univ. of Chicago from 1941–1950. From 1950 until his death he ved in both Sweden and the United States (Univ. of Chicago and Woods Hole). In 1939–he was Asst. Chief of the U. S. Weather Bureau. The note by BILANCINI is a review of an icle in *Time* (No. 25, 1956) about ROSSBY and his influence on meteorology. The pamphlet

by TOR BERGERON (in Swedish) is the most complete biographical sketch of those cited ab
Another review appeared in *Rivista Marittima*, 4, 1957: 127–133, **1957.** (For other obitua
see 9.2–74 and 9.5–40, Feb. and May 1958, *MAB.*) *Subject Headings:* **1. Obituary of C
Rossby 2. Rossby, C.-G.**—*M.R.*

10.5–90 533.6
Bradfield, F. B., **Dr. G. P. Douglas, O.B.E.** *Nature*, London, 174(4438):952–953, N
20, **1954. DWB**—Born 1892, died Oct. 16, 1954. Known for engineering work on w
tunnels at Farnborough; head of Aerodynamics Dept. 1934–1953. *Subject Headings:* **1. A
dynamics 2. Biography of G. P. Douglas 3. Douglas, G. P.**—*C.E.P.B.*

10.5–91 551.5
Wolcken, K., **[Biographical note on] Alfred Wegener, 1880–1930.** *Meteoros*, Bue
Aires, 5(4):379–382, Oct./Dec. **1955.** photo. **DWB**—An account of the life and scient
achievements of ALFRED WEGENER, including a photograph of the subject. *Subject Headi
1. Wegener, Alfred 2. Biography of A. Wegener.*—*I.L.D.*

10.5–92 551.5
Lauscher, F., **[Obituary note on] Josef Gutmann.** *Wetter und Leben*, Vienna, 9(3/5)
1957. DLC—JOSEF GUTMANN, secretary of the Central Institute of Meteorology and G
dynamics at Vienna, died 4 Aug. 1957. He was born 6 Feb. 1898. Since 1939, he had wor
in the climatological section of the Institute. His most important publication was t
dealing with the carrying out and evaluation of meteorological observation, observation
measuring methods of the weather service (Publ. N7.158 of the Central Institute for Met
ology and Geodynamics). *Subject Headings:* **1. Obituary of Josef Gutmann 2. Gutma
Josef.**—*I.L.D.*

10.5–93 551.5
Lauscher, F., **[Obituary note on] Friedrich Rosenkranz.** *Wetter und Leben*, Vien
9(3/5):81, **1957. DLC**—FRIEDRICH ROSENKRANZ (1900–1957) published various studies
phenology. Among his writings the following are important: **10 years of phenology in Aus
(*Germany. Reichsamt für Wetterdienst. Wissenschaftliche Abhandlungen*, Berlin, v. 8, no
1940) and his book **Grundzüge der Phänologie** [Principles of phenology] (1951). *Sub
Headings:* **1. Obituary of Friedrich Rosenkranz 2. Rosenkranz, Friedrich.**—*I.L.D.*

BIBLIOGRAPHY—DOCUMENTATION—TERMINOLOGY

See also: **Eng.-Russian oceanog. glossary,** 10.5–37; **Japanese met. glossaries,** 10.5–38.

10.5–94 551.58:00
Zamorskiĭ, A. D., **K opredeleniiu poniatiia klimata.** [Definition of the concept of clima
Vsesoiuznoe Geograficheskoe Obshchestvo, Leningrad, Izvestiia, 88(4):389–390, July/Aug., 19
DLC—The author attempts to demonstrate the physical nature of climate as an object
reality existing outside us and independent of the technical limitations imposed by the pract
requirements of observers in studying and describing climate. It consists of the atmosph
processes (weather phenomena) which are observed at a given place for a given histor
period of years. The historicity of climate is stressed. In a narrow sense, climate is a
tistical characteristic of a historical combination of weather at a given place over a long pe
of years. *Subject Headings:* **1. Climate 2. Definitions.**—*I.L.D.*

10.5–95 551.588:
†U. S. Quartermaster Research and Development Command, **Environmental resea
in the Quartermaster Corps: selected publications in climatology and geography.** April 19
7 p. (p. 5 missing). (551.5016 U585e) **DWB**—A chronological list of over 50 reference
publications of members of the staff of the environmental Protection Research Division of
QR&DC during the period 1943–1957. Literature from scientific publications as well
from internal reports or contract reports are included. Subject matter varies widely f

roclimate of tents or warehouses to wind chill, inversions, snow cover, visibility and ne. *Subject Heading:* **1. Environmental research bibliographies.**—*M.R.*

10.5–96 019.941(05)

†Cairo. Scientific and Technical Documentation Centre, **Bulletin, [Pt. 2], Abstracts of entific and technical papers published in Egypt and papers received from Afghanistan, prus, Iran, Iraq, Lebanon, Pakistan, Sudan and Syria,** Vol. 1, No. 1, Jan. 1955? Latest ue seen, 5(1), Jan. **1959.** Monthly. Title-page in English and French. Issued by National search Council of Egypt, Cairo, with collaboration of UNESCO Middle East Science operation Office, Cairo. Editor, Julio Garrido. Price: foreign, annual, $1.50 from National search Council.—The third section (usually on the first page) of this monthly Pan-Arabic entific and technical abstract periodical, comprises geophysics, with an occasional item on teorology or climatology of Egypt, the Near East or Middle East. Brief annotations or stracts accompany most of the citations. *Subject Headings:* **1. Abstracting periodicals Arabic abstracts. I. Egypt. National Research Council II. Garrido, Julio** (*ed.*).—*M.R.*

10.5–97 002:016

Shaw, Ralph R., **Mechanical storage, handling, retrieval and supply of information.** *rth Atlantic Treaty Organization. Advisory Group for Aeronautical Research and Develop- nt, Report,* No. 50, Feb. **1956.** 34 p. **DWB** (629.1308 N864r)—The technical and ad- inistrative problems involved in the storage, handling, and retrieval of library information emphasized throughout this detailed account of the present equipment used. Reference made to previous studies and suggestions given for future research. Particular attention paid to the need for fundamental systems studies and for fuller investigation of the require- nts of the scholar. The author concludes that the problem has proceeded in a piecemeal "gadget" fashion and stresses the need for more detailed analysis of the usefulness and nomic justification of each separate piece of machinery, without, however, losing sight of problem in its entirety. By way of practical illustration, a method for making the resources Harvard University's Lamont Library available to all colleges is suggested. *Subject Heading:* **Information retrieval.**—*Author's abstract.*

10.5–98 019.941

Sherrod, John (*Science Div., Library of Cong., Wash.*), **Preparing the technical abstract.** *nerican Meteorological Society, Bulletin,* 38(8):496–497, Oct. **1957.** 8 refs. **DWB**—The mentary principles of abstract writing are reviewed; the distinction between an indicative d an informative abstract is clearly drawn; and 10 simple rules to be followed in preparation technical abstracts, with special application to meteorology and kindred subjects, are pro- sed. *Subject Heading:* **1. Abstracting.**—*M.R.*

10.5–99 551.5:061.6(45)

†Bilancini, Raoul, **Gli studi meteorologici in Italia nel triennio 1954–1956.** [Meteoro- ical research in Italy, 1954–1956.] *Rivista di Meteorologia Aeronautica,* Rome, 18(22):50– April/June **1958.** 174 refs. **DLC**—A short survey of meteorological works published in ly during the three years 1954–1956, with a rich bibliography appended thereto. *Subject adings:* **1. Meteorological research in Italy 2. Italy.**—*Author's abstract.*

PRACTICAL AND APPLIED METEOROLOGY

MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **Eng.-Russian oceanog. glossary,** 10.5–37; **Mariner's Weather Log** (Bristow), 10.5–41; **Salt content of ice, Finnish Coast** (Uusitalo), 10.5–137; **Ocean waves in typhoons** (Unoki), 10.5–237; **Solar radiation absorption and effects on sea temps.** (Boguslavskiĭ), 10.5–250.

10.5–100 551.46.018

Nakano, Masito (*Met. Res. Inst., Tokyo*), **Some oceanographical instruments recently vised in Japan.** (In: Angola Servico Meteorológico, **Miscelanea geofisica.** Luanda, **1956.**

p. 206–222. 16 figs., 15 refs.) **DWB** (M(08) A592mi)—In the present paper, a brief descr tion is given of several oceanographical instruments, especially relating to physical ocea ography, which have been recently devised in Japan. The items treated are as follow a) current meters; b) wave recorders; c) wave analyzers; d) Tele-tide-gauges; e) a temperatu depth recorder; f) a remote-reading and -recording mercury thermometer with sealed carb filament; g) a plastic water sampler; h) others. For each of these instruments, the c struction and mechanism or capability of it are briefly mentioned, together with the results experiments made with it. *Subject Heading:* **1. Oceanographic instruments.**—*Autho abstract.*

10.5–101 551.554 551.573:551

Ogata, T. et al., **On the meteorological condition near the sea surface at "Tango," Pt** *Journal of Meteorological Research*, Tokyo, 10(3):164–172, March **1958.** 4 figs., 3 tables, refs., 4 eqs. In Japanese; English summary p. 164. **DWB, DLC**—The authors examin the wind velocity along vertical near the sea surface and the evaporation from the sea surf at "Tango" (29°N, 135°E), and obtained results as follows: 1) Wind velocity distribut along vertical near the sea surface is given as

$$\frac{u}{u_s} = a \log_{10} \frac{z}{z_s} + b,$$

where u is the wind velocity at altitude z above the sea surface, u_s that at a fixed leve ($z_s = 11.12$ m); and a and b vary according to the stratification of air layer as

$$a = 0.256,\ b = 0.994 \text{ (isothermal)}$$
$$a = 0.356,\ b = 1.101 \text{ (lapse)}.$$

Here "isothermal" expresses a case where the difference between surface water temperat and air temperature at $z = 6.5$ m is $+0.3°$ to $-0.3°$C, and "lapse" a case where the differe is larger than 0.4°C. 2) Evaporation from the sea surface was observed on the raft as sho in Photo. 4 (tables 2 and 3). The result shows that the amount of evaporation is larger t that calculated by SVERDRUP's theoretical formula. *Subject Headings:* **1. Wind veloc distribution 2. Evaporation from sea surfaces 3. Ocean Weather Station Tango.**—*Auth abstract.*

10.5–102 551.464 614

Ketchum, Bostwick H. and Ford, William L., **Rate of dispersion in the wake of a ba at sea.** *American Geophysical Union, Transactions*, Pt. 1, 33(5):680–684, Oct. **1952.** 3 fi 3 tables, 7 refs. **DWB**—In order to study and analyze the dispersion of a pollutant, 6000 t of waste material (10% $FeSO_4$ and 8.5% H_2SO_4) from the titanium plant of the Natio Lead Co. were carried to sea in specially constructed barges and discharged. Tables pres time and quantity of discharge and mixing coefficient required to give observed quantities iron in the wake of a barge. Curves show (1) salinity, temperature and density of wa during the three test periods (April and July, 1948, Jan. 1949) and (2) for forecasting mix The distribution of the iron is explained in terms of rate of discharge and the horizontal mix coefficient (i.e., the joint effects of the turbulence induced by the passage of the barge and normal turbulence of the sea). *Subject Headings:* **1. Dispersion of contaminants 2. W pollution.**—*W.N.*

10.5–103 55

*Anderson, William Wyatt; Gehringer, Jack W. and Cohen, Edward, **Physical ocea graphic, biological, and chemical data, South Atlantic coast of the United States, M/V Theo N. Gill Cruise 1.** *U. S. Fish and Wildlife Service, Special Scientific Report—Fisheries*, No. Aug. **1956.** 160 p. Mostly tables. **DWB** (639.206 U583sp)—Procedures, methods, eq ment and plan of the cruises off the South Atlantic Coast of the U. S. during Feb. 12–Ma 7, 1953. A series of 80 regular stations were set up between Jupiter Light in Florida St and Cape Hatteras, 20 mi apart on the E-W line and 40 mi apart on a N-S line. The stand station was at a location off Elbow Cay, Bahamas. Nine special stations were located far

shore for the U. S. Hydrographic Office. Nine cruises were carried out between Jan., 1952 d Dec., 1954. *Subject Headings:* **1. Oceanographic cruise data 2. "Theodore N. Gill" uise, 1952 3. South Atlantic Coast, U. S.**—*M.R.*

10.5–104 551.46(263) 551.506(263)

*Anderson, William W. and Gehringer, Jack W. (*Fishery Research Biologists*), **Physical anographic, biological and chemical data, South Atlantic coast of the United States, eodore N. Gill Cruise 3 and 4.** *U. S. Fish and Wildlife Service, Special Scientific Report—sheries*, No. 210, June **1957** and No. 234, Dec. **1957.** 208 p., 192 p. Almost entirely tables. **VB** (639.206 U583sp)—These reports are similar to those for cruise No. 1 (*see* 10.5–103, *AB*), consisting mainly of tables and cross-sections of data. Cruise 3 occupied 77 stations, standard stations, and 9 special stations between Brunswick, Ga., Cape Hatteras, N. C., d the tip of Florida starting on July 15, 1953 and ending Aug. 12, 1953. Cruise 4 left unswick Oct. 1, 1953, proceeding to Nassau, B.W.I. (Oct. 5), investigating a tongue of the an south of New Providence Island on Oct. 7th and 8th, and occupying all but one of 34 tions, returning Oct. 17 to Brunswick and starting on northern leg of cruise Oct. 21, returning v. 14. Fifteen casts were made to 1000 m depth. Bathythermograph observation, routine teorological observation and special plankton tows were made throughout the cruise. bles give weather, cloud type, sea amount, swell amount, visibility, temperature, etc. *bject Headings:* **1. Oceanographic cruise data 2. "Theodore N. Gill" Cruise, 1953 3. South lantic Coastal Waters, U. S.**—*M.R.*

10.5–105 551.463:551.264(266)

*Collias, Eugene E.; Love, Cuthbert M. and Paquette, Robert G., **Eastern North Pacific d Gulf of Alaska, offshore physical and chemical data, April 1954–Jan. 1955.** Washington tate). Univ. Dept. of Oceanography, Contract N8onr-520/III, Contract Nonr-477(10), ntract Nonr-477(01), Technical Report, No. 49, June **1956.** 33 p. 2 maps, 5 refs. Almost tirely tables. Also: Washington (State). Univ. Dept. of Oceanography, **Physical and emical data, Puget Sound and approaches, Jan. 1955–March 1956.** Contract N8onr-0/III, Contract Nonr-477(10), Contract Nonr-477(01), Technical Report, No. 51, Aug. **1956.** 1 p. maps, 7 refs. Almost entirely tables. **DWB**—First report tabulates physical and emical observations made at various locations off the coasts of Washington and Oregon d in the Gulf of Alaska during the period April 1954 to Jan. 1955 by the Dept. of Ocean-raphy of the Univ. of Washington on the research vessel "Brown Bear"; and at various ations in Puget Sound and its approaches during the period from Jan. 1955 through March 56 in the second report. A detailed monthly survey of Carr Inlet begun in Feb. 1954 was npleted in Feb. 1955. Charts show the positions of the stations sampled. Values are en for temperature, salinity, dissolved oxygen and dissolved inorganic phosphate over a nge of depths from the surface to near bottom as determined using accepted oceanographic hniques. *Subject Headings:* **1. Oceanographic observations 2. Oceanographic chemistry Gulf of Alaska 4. Northeastern Pacific 5. Puget Sound 6. Carr Inlet. I. Contract onr-520/III II. Contract Nonr-477(10) III. Contract Nonr-477(01) IV. Washington tate). Univ. Dept. of Oceanography.**—*Authors' abstracts.*

10.5–106 551.463

Konaga, Shunji, **Kuroshio in Enshunada, Pt. 2, On the T-σt relation.** *Kobe, Japan. arine Observatory, Memoirs*, 12(2):27–31, March **1958.** 4 figs., 3 tables, 5 refs., 8 eqs. **VB**—Recently, oceanographic observations using the bathythermograph have been carried t, providing opportunities to observe water temperature alone, from which it is preferable know approximately the density of sea water. This problem was discussed for the sea ith of Honshū by Yasui (9155). He formulated the chlorinity as a function of the water nperature, so that the T-Cl diagram was for uniform water mass. And then he showed σ_t a function of the temperature alone, and computed the dynamic depth anomalies in a nplified form as follows:

$$\Delta^D \propto \int_0^D T dT.$$

It is very useful, but his formulas are based on T-Cl relationships, which are so complicate that we try to describe σ_t, computed by means of the Knudsen table, as a function of th temperature alone in this paper. *Subject Headings:* **1. Water temperature determinatio** —*Author's abstract.*

GEOMAGNETISM

See also: **Japanese geomag. obs., Antarctica** (Nagata, Oguti), 10.5–64; **F_1 layer height-magnetic storm rel.** (Tandberg-Hanssen), 10.5–210.

ASTRONAUTICS—SATELLITE OBSERVATORIES

See also: **Rocketry and astronometers** (Burgess), 10.5–20; **Satellite tracking,** 10.5–49.

10.5–107 629.19:551.507.362

Grant, Gordon (*Warner & Swasey Obs., Case Inst. of Tech., Cleveland*); Jones, A. L Burhans, R. W.; Fay, P. S. and Frazier, David (*all, Chem. & Physical Res. Division, Standa Oil Co., Ohio*), **Determination of orbital characteristics of an earth satellite from single-statio radio-transit observations.** *Nature*, London, 181(4613):900–901, March 29, **1958.** fi **DWB**—Meridian transit radio observations have been made of the satellite 1958 α by mean of a modified Minitrack Mark II interferometer located at the Sohio Research Laboratori east of Cleveland, Ohio (lat. 41°26.3′N, long. 81°32′W). The time between successive meridia passages (the synoptic period) was found to give a considerable amount of information on th orbital characteristics of the satellite. Details of the orbital calculations are included. *Subje Headings:* **1. Satellite tracking 2. Satellite orbits.**—*N.N.*

10.5–108 551.507.362

Lemmens, J. **Observation de satellite artificiel 1957 β effectuée le 24 janvier 1958.** [O servation of the artificial satellite 1957 β, made on Jan. 24, 1958.] *Académie Royale Belgique, Brussels, Bulletin de la Classe des Sciences*, Ser. 5, 64(2):134, Feb. **1958. DLC** Visual observation of the second artificial satellite. *Subject Headings:* **1. Satellite trackin 2. U.S.S.R. satellite Beta one.**—*A.V.*

10.5–109 629.19:551.507.362

Oblakov, F. V., **Nabliudeniia za iskusstvennym sputnikom zemli.** [Observations on th artificial earth satellite.] *Meteorologiia i Gidrologiia*, Leningrad, No. 2:42, **1958. DW DLC**—On Oct. 15 and 16 the artificial earth satellite passed over Maikop in the rays of th rising sun. The satellite appeared at 0505 o'clock and was visible to the naked eye. It wa as bright as a star. On Oct. 15 the readings of the vertical and horizontal angles were mad at 0507 o'clock and 0508 o'clock. On Oct. 16 the rocket carrier was observed at 0501 o'clo and readings were made every thirty sec. *Subject Heading:* **1. Satellite tracking.**—*I.L.D.*

10.5–110 535.3:629.

Weekes, K., (*Cavendish Labs., Cambridge*), **On the interpretation of the Doppler effe from senders in an artificial satellite.** *Journal of Atmospheric and Terrestrial Physics*, N. Y 12(4):335–338, **1958.** fig., 2 refs., 6 eqs. **DLC**—In 1929 MIRICK and HENTSCHEL observe beats in the signal strength of radio waves from an aircraft at a fixed receiver. They inte preted these beats as interference effects between a direct ray and a ray reflected from th ionosphere and deduced a height for the effective reflecting layer. APPLETON (1930) compare this method of estimating the height of the ionosphere with those previously used. He show that the beat could be regarded as a Doppler beat between the rays arriving by the two pat and that, as the height of the aircraft was negligible compared to that of the ionosphere, th experiment measured directly sin i where i is the angle of incidence of the ray on the reflecti layer. This problem is very similar to that of the observation of the Doppler effect from sender in an artificial satellite and it is of interest to enquire whether the Doppler shift depen simply on sin i in this case when the sender is in the ionized medium and the distances a such that allowance must be made for the curvature of the earth. *Subject Headings:* **1. Doppl effect 2. Satellite communication.**—*Author's abstract.*

10.5–111 551.506.9:551.507.362.2

*Schilling, G. F. and Sterne, T. E. (*both, Astrophysical Obs., Smithsonian Inst.*), **Preliminary orbit information for USSR satellites Alpha one and Alpha two.** *Smithsonian Institution. Astrophysical Observatory, IGY Project No. 30.10, Special Report*, No. 1, Oct. 14, 1957; re-issued: Dec. 2, 1957. 20 p. tables. Also issued in "edited form" as *Smithsonian Contributions to Astrophysics*, Wash., D. C., 2(10):191–198, 1958. **DWB, DLC**—This is the first report on notification, reception, tracking, bulletins on reception, and predicted tracks of the first Soviet Sputnik launched Oct. 4, 1957. The orbit inclination was 65°, periodicity 96 m; weight 83.6 kg, diameter 58 cm, output 1 watt, high frequency 40.002 Mc, low frequency 20.005 Mc. First reception of radio signals at NRL in Washington, D. C., was at 20.45 EDT, Oct. 4. *Subject Headings:* **1. Satellite orbit data 2. U.S.S.R. satellite, Alpha one 3. U.S.S.R. satellite, Alpha two 3. Sputnik.**—*M.R.*

10.5–112 551.506.9:551.507.362.2

*Schilling, G. F. and Fergusson, E. S. (*both, Astrophysical Obs., Smithsonian Inst.*), **Soviet orbit predictions and orbital information for USSR satellites 1957 Alpha one, Alpha two and Beta.** *Smithsonian Institution. Astrophysical Observatory, IGY Project No. 30.10, Special Report*, No. 5, Dec. 4, 1957. 51 p. mostly tables. 4 refs. Also issued in "edited form" as *Smithsonian Contributions to Astrophysics*, Wash., D. C., 2(10):219–244, 1958. **DWB, DLC**—The Soviet predictions on positions and times of passage overhead of U.S.S.R. satellites (1957); Alpha one (carrier rocket), Alpha 2 (Sputnik) launched Oct. 4, 1957, and Beta the instrumented rocket launched Nov. 3, 1957, as issued from Oct. 23, 1957 to Dec. 6, 1957 in Soviet newspapers and radio broadcasts. Other technical information released during this period is appended and results tabulated. *Subject Headings:* **1. Satellite orbit data 2. U.S.S.R. satellites, 1957 U.S.S.R. satellite, Alpha one 4. U.S.S.R. satellite, Alpha two 5. U.S.S.R. satellite, Beta one.**—*M.R.*

10.5–113 551.506.9:551.507.362.2

*Campbell, Leon, Jr. and Hynek, J. A. (*both, Astrophysical Obs., Smithsonian Inst.*), **Visual observations of Alpha one made by Moonwatch stations during lifetime of the object.** *Smithsonian Institution. Astrophysical Observatory, IGY Project No. 30.10, Special Report*, No. 6, Dec. 17, 1957. 50 p. mostly tables. Also issued in "edited form" as *Smithsonian Contributions to Astrophysics*, Wash., D. C., 2(10):245–274, 1958. **DWB, DLC**—Visual observations of U.S.S.R. satellite Alpha one by >200 Moonwatch stations around the world made it possible to obtain 391 significant sightings. The Moonwatch Program and a chronological listing of Moonwatch observations during the eight-week life of Alpha one, analyzed at Cambridge, Mass. (plus 50 observations of Beta), are presented and discussed. The 205 observations were obtained in eleven countries (114 in U. S., 71 in Japan, 4 each in Argentina, Australia and South Africa, 3 in Chile and one each in five other countries). *Subject Headings:* **1. Visual satellite observations 2. Moonwatch observational data 3. U.S.S.R. satellite, Alpha one 4. U.S.S.R. satellite, Beta one.**—*M.R.*

10.5–114 551.506.9:551.507.362.2

*Schilling, G. F. (*Astrophysical Obs., Smithsonian Inst.*), **Soviet orbit information for USSR satellites 1957 Alpha two and Beta one.** *Smithsonian Institution. Astrophysical Observatory, IGY Project No. 30.10, Special Report*, No. 8, Jan. 31, 1958. 14 p. fig., numerous tables, refs. Also issued in "edited form" as *Smithsonian Contributions to Astrophysics*, Wash., D. C., 2(10):281–284, 1958. **DWB, DLC**—Data from Dec. 6, 1957 to Jan. 29, 1958 on revolutions and path distance of satellites Alpha two and Beta one; periods and heights, final orbit, decay of Alpha one and two, and zones of visibility are given in tables and graphs, and discussed. Detailed point-point data reports on positions are not given, but summarizations thereof are included. *Subject Headings:* **1. U.S.S.R. satellites, Alpha two 2. U.S.S.R. satellite, Beta one Satellite orbit data.**—*M.R.*

10.5–115 551.506.9:551.507.362.2

*Jacchia, Luigi G. (*Astrophysical Obs., Smithsonian Inst.*), **Basic orbital data for satellite 1957 Beta one.** *Smithsonian Institution. Astrophysical Observatory, IGY Project No. 30.10,*

Special Report, No. 9, Feb. 21, **1958.** 7 p. fig., 3 tables, 3 refs. Also issued in "edited form" as *Smithsonian Contributions to Astrophysics*, Wash., D. C., 2(10):285–286. **DWB, DLC**—Results of 1100 optical and radio observations of satellite 1957 Beta one during Nov., Dec. 1957 and Jan. and Feb. (to Feb. 10) 1958 are tabulated and discussed. *Subject Headings:* **1. U.S.S.R. satellite, Beta one 2. Satellite orbit data.**—*M.R.*

10.5–116 551.506.9:551.507.362

*Adams, R. M.; McCumber, N. and Brinkman, M. (*all, Astrophysical Obs., Smithsonian Inst.*), **Processed observational data for USSR satellites 1957 Alpha and 1957 Beta.** *Smithsonian Institution. Astrophysical Observatory, IGY Project No.* 30.10, *Special Report*, No. 10, March 1, **1958.** 120 p. mostly tables. Also issued in "edited form" in *Smithsonian Contributions to Astrophysics*, Wash., D. C., 2(10):286–337, **1958. DWB, DLC**—The voluminous processed data from all over the world for U.S.S.R. satellites Alpha one and two and Beta from time of launching (Oct. 4 and Nov. 3, 1957) through mid-Feb. 1958 (or until termination of orbit) are presented *in extension* and discussed. Data are from both visual or photographic and radio or radar tracking, and all are computed on an IBM 704. Thus far 4500 visual and photographic observations have been received, of which 2980 have been processed. Data are arranged by date from Oct. 5, 1957 to Feb. 19, 1958. A register of stations, station numbers and coordinates are appended. *Subject Headings:* **1. U.S.S.R. satellites, 1957 2. U.S.S.R. satellite, Alpha one 3. U.S.S.R. satellite Alpha two 4. U.S.S.R. satellite, Beta one 5. Satellite observational data 6. Moonwatch stations.**—*M.R.*

10.5–117 551.507.362

Stine, G. Harry, **Earth satellites and the race for space superiority.** N. Y., Ace Books, **1957.** 191 p. figs. **DWB** (629.1388 S859ea)—A popular "pocket" book giving the history, facts and predictions regarding rockets, satellites, space platforms and observatories, space travel as of 1957 (before the Sputnik was launched). It features "Vanguard" which was expected to succeed. *Subject Headings:* **1. Satellites observatories 2. Rocket development 3. Project Vanguard.**—*M.R.*

10.5–118 533.6:629.1

Nonweiler, T., **Problems of missiles entering the atmosphere.** *British Interplanetary Society, Journal*, 10(1):26–35, Jan. **1951.** tables, 2 refs., eqs. **DLC**—The velocity of impact and the maximum skin temperature of a missile entering the atmosphere are analyzed as functions of the drag coefficient and the angle of descent. Several possibilities of missile design and of orientation are considered. Details of descent for a nimonic steel cone with a 12° apex angle chosen as an example are tabulated. *Subject Headings:* **1. Rocket research 2. Aerodynamic heating.**—*G.T.*

AGRICULTURAL METEOROLOGY

See also: **Agromet. textbooks** (Kiriakov, Todorov), 10.5–13; **Microclimat. and agric.** (Gol'tsberg), 10.5–30; **Agromet. texts, U.S.S.R.** (Maksimov), 10.5–31; **Agromet. services, U.S.S.R.** (Okushko), 10.5–68; **Agromet. conferences** (Zakharov), 10.5–74; **Agricultural climatology, Addis Ababa, Ethiopia** (Kuls), 10.5–320; **Drained swamp microclimatology, Northwest U.S.S.R.** (Glebova), 10.5–322; **Rice paddy microclimatology, Kopáncs, Hungary** (Wagner), 10.5–323.

10.5–119 551.586:63(02)(5

*Skovronskaia, Alevtina Evgen'evna and Andrushko, Valentine M., **Kratkiĭ agroklimaticheskii spravochnik po Cheliabinskoĭ oblasti.** [Short agroclimatological handbook of the Chelyabinsk Oblast.] Chelyabinsk, Cheliabinskoe Knizhnoe Izdatvo, **1957.** 34 p. 2 charts, 19 tables. **DLC** (S600.S58)—This is one of a new series of regional agroclimatic bulletins which meteorological data from the 1946 edition of the **Climatological Handbook,** No. 1 **(1946),** for the years 1891–1935 or 1940, plus tabular data for 1934–1955 for 39 stations in the Chelyabinsk Oblast, are used to describe the conditions applicable to crops on a seasonal basis, starting with autumn and by months within each season. Appended are tables and

art showing the administrative regions and agrometeorological stations in the Chelyabinsk blast (52°–56°N, 58°–63°E). Tables include: (1) decadal mean temperatures for 15 stations;) dates of first and last mean daily temperatures of 0°, 5°, 10°, and 15°C (23 stations);) degree days accumulated from April to Oct. for 0°, 5°, 10°, and 15° base; (4) frost dates d frost free period; (5) frost frequency May–Sept. 0, −1, −3, −5°C base; (6) and (7) fluence of local topography on frost intensity and frost free period; (8) mean relative humidity 13h by decades and number of days a month $\geqslant 80\%$ or $\leqslant 30\%$; (9) mean decadal precipitation (30 stations); (10) depth of snow cover by decades; (11) snow cover dates; (12) general imatic tables by administrative regions and 8 detailed soil moisture-crop condition tables Chelyabinsk Oblast is east of the southern Urals). *Subject Headings:* **1. Agroclimatic handbooks 2. Climate of Chelyabinsk Oblast 3. Chelyabinsk Oblast, Asiatic U.S.S.R.**—*M.R.*

AERONAUTICAL METEOROLOGY

See also: **Aviation met. texts., Switzerland** (Eichenberger), 10.5–10; **Aviation met. texts., W. Germany** (Noth), 10.5–17; **Airplane icing** (Mazin), 10.5–26; **Bumpiness and atmos. turbulence** (Pinus), 10.5–271.

10.5–120 533.697

Corrsin, Stanley (*Johns Hopkins Univ., Baltimore, Md.*), **Statistical behavior of a reacting ixture in isotropic turbulence.** *Physics of Fluids*, (pub. by American Institute of Physics), . Y., 1(1):42–47, Jan./Feb. **1958.** 10 refs., 61 eqs. **DWB, DLC** –Under the restrictions of A) isotropy in turbulent velocity and concentration fluctuation fields, (B) negligible effect of action on fluid motion, and (C) negligible effect of heat of reaction on local reaction rate, uations have been deduced for some statistical functions of the concentration of reactant. or a first-order reaction the simplest equations do not differ in general character from those pure mixing without reaction, but the nonlinear nature of second-order reactions introduces cided differences. Solutions for the decay rates of mean concentration and fluctuations ve been obtained in some limiting cases and with some simplifying assumptions. The incipal hypothesis introduced is that a first-order reaction has no effect on the size structure the scalar field. *Subject Headings:* **1. Isotropic turbulence 2. Turbulent mixing.**—*Author's stract.*

105.–121 533.6.01

Dorrance, William H. (*Convair, San Diego, Calif.*), **Some problems in the aerothermoynamics of hypersonic flight).** (In: **The threshold of space,** ed. by M. Zelikoff. N. Y., ergamon Press, **1957.** p. 243–248. 6 figs., table, 6 refs.) **DLC**—This paper presents a rvey of problems encountered to date in some aerothermodynamic analyses of bodies in ypersonic flight within the earth's atmosphere. Special attention is paid to phenomena resent owing to the fact that air is not a perfect gas. The regime of interest in hypersonic ntinuum flow is bounded, the ambient regions of interest defined and special shock wave, undary layer and mixed flow regime problems discussed. The paper concludes with a atement of physical properties of air required to continue aerothermodynamic analyses in the ntinuum, hypersonic flight regime. *Subject Headings:* **1. Aerothermodynamics 2. Hypernic flight.**—*Author's abstract.*

10.5–122 533.697:621.45

Hertzberg, A. and Logan, J. G., Jr. (*both, Cornell Aeronautical Lab., Cornell Univ., Buffalo, . Y.*), **The application of the shock tube to the study of the aerothermal problems of high-peed flight.** (In: **The threshold of space,** ed. by M. Zelikoff. N. Y., Pergamon Press, **1957.** 276–287. 11 figs., 15 refs.) **DLC** –The shock tube has recently become an effective tool r the study of high temperature phenomena in gases. At Cornell Aeronautical Laboratory, odifications of the shock tube have been developed for the experimental investigation of a ariety of problems connected with high-speed flight. In particular, the shock tube has been plied to the study of real gas hypersonic flow phenomena, relaxation phenomena and the netics of chemical reactions. The kinetics of the reaction $N_2+O_2 \leftrightharpoons 2NO$ has been studied a special shock tube and preliminary data are presented on the activation energy and the

reaction mechanism in the temperature range between 2000°K and 3000°K. *Subject Heading* **1. Aerodynamics 2. Shock tubes 3. High speed engines.**—*Authors' abstract.*

10.5–123 551.574.1:629.13

Lebon, J. H. G., **A flying cloud-chamber.** *Weather*, 12(8):265, Aug. **1957. DWB**— Summary of errors and uncritical remarks in accounts of blowing out of a window of a pressur ized aircraft at 17,500 ft. *Subject Headings:* **1. Cloud physics 2. Aircraft accidents.**—*C.E.P.B.*

10.5–124 551.507.351:551.515.

§**Rückseitenweter.** [The weather after the passage of a disturbance.] *Schweizer Aero Revue, Berne*, 33(6):316–317, June **1958.** 2 figs. **DLC**—The author gives the description of flight performed in Switzerland with a sailplane, after the passage of a cold front and th arrival of a warm front. The synoptic charts and the soundings of April 25 and 26, 1958 are reproduced. *Subject Headings:* **1. Gliding flights 2. Fronts 3. Switzerland.**—*A.V.*

10.5–125 551.5:629.1

†U. S. National Advisory Committee for Aeronautics, **Forty-first annual report, 1955** Washington, D. C., **1955.** 68 p. Research publications, p. 51–60. Also: **Forty-second annua report, 1956.** Washington, D. C., **1956.** 89 p. Research publications, p. 69–79. Also **Forty-third annual report, 1957.** pub. **1957.** 79 p. **DWB, DLC**—Research by NACA o gust loads is summarized on p. 40 in the 1955 report (p. 56–7 in 1956 report); on aeronautica meteorology on p. 49 (p. 67–68 in 1956) and on icing problems and protection on p. 50 (p. 6 in 1956). A list of nearly 400 research reports, technical notes and technical articles by sta members is given on p. 51–60 (p. 69–79 in 1956). Staff and members of committees are als listed, e.g., Subcommittee on Meteorological Problems, p. 66–67 (p. 87) and on Icing Problems on p. 67 (p. 87 in 1956). *Subject Headings:* **1. Aeronautical meteorology 2. Icing research** —*M.R.*

FOREST METEOROLOGY

10.5–126 551.515.2:551.556.1:634.9(74

Jones, Nard, **Man from the hurricane.** *American Forests*, Wash., D. C., 60(2):16–18, 4 Feb. **1954.** 2 figs. (incl. photo). **DWB, DLC**—The 1938 hurricane in New England gav Ted Tinker, at that time Asst. Chief of the U. S. Forest Service, a chance to show his organiz ing ability in the salvaging of thousands of acres of trees that had been blown down. Fro this task he went on to become Executive Secretary of the American Paper and Pulp Associa tion. At present (1953), the American forestry industry employs 1233 professional foresters whereas 10 yrs earlier it employed only 400. The viewpoint of the forestry industry is ap proaching that of the U. S. Forest Service and vice-versa, with respect to conservation an management of forest lands. *Subject Headings:* **1. Hurricane damage 2. New Englan hurricane—1938 3. Forest management 4. New England.**—*M.R.*

10.5–127 551.584.41(439.1

Papp, László, **Szemelvények az erdészeti mikroklímakutatás köréből, különös tekintette a kopár oldalakra.** [Review of research in forest microclimatology, with particular attentio to bare slopes.] *Időjárás*, Budapest, 61(2):98–110, March/April **1957.** 7 figs., 2 table 12 refs. Russian summary p. 98. **DLC**—Air and soil temperature, wind speed, humidit and evaporation data obtained in Hungary on sand hills, on slopes of bare earth and on rock slopes of various orientation and orography are presented and discussed. Effects of metho of cultivation upon microclimate are also shown. Instruments and techniques used ar described. *Subject Headings:* **1. Forest microclimates 2. Hungary.**—*G.T.*

10.5–128 551.588.6:551.583.3:581.1

Potzger, J. E.; Courtemanche, A.; Sylvio, Br. M. and Hueber, F. M., **Pollen from mos polsters on the mat of Lac Shaw bog, Quebec, correlated with a forest survey.** *Montrea Canada. Université. Service de Biogéographie, Bulletin*, No. 18, Sept. **1957.** 12 pages, 2 figs 2 tables, 7 refs.—Reprinted from: *Butler University Botanical Studies*, 13(1):24–35, **1956.**

sults of a study, carried out on an accurately delimited and checked off area in the spruce-fir est adjoining the Lac Shaw bog in Mont Tremblant Park, in order to define the extent to ich a pollen rain is representative of the abundance of genera and species participating in e forest community. *Subject Headings:* **1. Pollen analysis 2. Forest meteorology Canada.**—*A. V.*

10.5–129 551.584.41

Spurr, Stephen H. (*Michigan Univ., Ann Arbor*), **Local climate in the Harvard Forest.** *ology*, Durham, N. Carolina, 38(1):37–46, Jan. **1957.** 2 figs., 3 tables, 18 refs. **DWB**—alysis of two yrs (1943–45) of climatic data for a dozen stations in Harvard Forest in central assachusetts to bring out local temperature variations and variations with type and height shelter, with topographic location and within a plantation; variation in evaporation with pography, frost damage (May 1944), and influence of local climate on forest composition. nclusion is that concave areas have greater temperature variation and shorter growing asons, and convex areas have less extreme temperatures and longer growing seasons. Dense ver moderates extremes in both cases but does not affect means. Precipitation data for 13–48 are used to compare with 1943–45 data. *Subject Headings:* **1. Forest microclimates Harvard Forest, Central Massachusetts.**—*M. R.*

10.5–130 551.584.41:551.573

Selleck, G. W. (*Dept. of Plant Ecology, Univ. of Saskatchewan, Canada*), and Schuppert, K., *J. S. Air Force, Hampton, Va.*), **Some aspects of microclimate in a pine forest and in an jacent prairie.** *Ecology*, Durham, N. Carolina, 38(4):650–653, Oct. **1957.** 4 figs., table, refs. **DWB**—Temperature, relative humidity and evaporation were measured at two es with the same soil type in a pine forest and in a prairie, respectively, in and near a 23 yr 1 red pine stand at the University of Wisconsin Arboretum. Water losses were measured the Lowry (1956) method. Water loss in the open was >4 times that in the forest. In the rest there seemed to be no relation between evaporation and relative humidity. The pans th holes gave 13% less water loss by evaporation than the pans without holes, and agreed tter with humidity in the prairie environment. *Subject Headings:* **1. Forest microclimates Evaporation in forests and prairies 3. Univ. of Wisconsin Arboretum, Wisc.**—*M. R.*

GLACIER ICE AND SEA ICE

See also: **Ice explorations and photos, Iceland and Greenland** (Wustmann), 10.5–35; **Climatic variations, Greenland** (Georgi), 10.5–58; **Ice thickness meas. techniques, Greenland** (Brockamp), 10.5–59.

10.5–131 551.583.3

Gullentops, F., **La cause des glaciations.** [The cause of glaciations.] *Revue des Questions ientifiques*, Louvain, 19(2):221–235, April **1958.** 2 figs.—The globe undergoes at long tervals a decrease of temperature; secondary disturbances determine at those moments ice- es and inter ice-ages. The author concurs with FLINT's proposition: ice-ages are prepared rough important changes of the terrestrial topography, which are always superposed on is general climate, successively showing themselves through glacial and inter-glacial phases. *ubject Heading:* **1. Ice age theories.**—*A. V.*

10.5–132 551.311.12

Renaud, A. (*Lausanne*) and de Haller, P. (*Winterthur*), **Recherches sur la teneur en eau urde dè l'eau des bassins glaciaires.** [Research on the heavy water content of glacial sins.] *Schweizerische Naturforschende Gesellschaft, Verhandlungen*, 136:98–100, **1956.** ble, .10 refs, **DWB, DLC**—Earlier studies by A. EUCKEN and K. SCHÄFER, etc., have monstrated that the terminal parts of glaciers have concentrations of heavy water greater an the mean content of natural waters. In this study, the authors report the results of an alysis of 101 samples of snow, ice and water in the basins of the Rhône and Aar in order determine the deuterium content: the latter was determined by the gravimetric method KIRSCHENBAUM. A table giving the D^2O content is presented. In respect to the standard

content of D^2O adopted for natural waters, 0.0148% mol, the waters of the glacial basin a relatively poor in heavy water, but they indicate a slight excess in the terminal part of glacie and on their issuing streams. The enrichment in D^2O is less than that reported by EUCKI and SCHÄFER. The values obtained in this study corroborate those found by FRIEDMAN and BOATE and CRAIG. *Subject Headings:* **1. Heavy water content of glaciers 2. Rho Basin 3. Aar Basin.**—*I.L.D.*

10.5–133 550.34:551.311.18(98

Bentley, Charles R.; Pomeroy, Paul W. and Dorman, H. James, (*all, Lamont Geologic Obs., Columbia Univ.*), **Seismic measurements on the Greenland Ice Cap.** *Annales de Gé physique*, Paris, 13(4):253–285, Oct./Dec. **1957.** figs., tables, refs., eqs. French and Engli summaries p. 253. **DLC**—A detailed refraction profile was made along a 10-mile line runni north-south at 76°59'W on the Greenland Ice Cap. The compressional wave velocity ma mum of 3,865 m/sec is reached at a depth of 350 meters. Shear waves were recorded with maximum velocity of 1,940±10 m/sec. A posson's ratio of .332 at depth is indicated. R fracted arrivals from beneath the ice indicate a velocity of 5, 8000±20 m/sec. A layer approximately 100 meters thickness exists between the ice and the refracting layer. Botto reflected waves (R_p, R_s and R_{ps}) were recorded. Seismic evidence is against a liquid lay at the base of the ice. Long period reflected shear waves with a constant frequency we observed; an interference mechanism in the bottom layer may account for this phase. surface wave dispersion curve was constructed covering a period range of .03 to .3 secon *Subject Headings:* **1. Seismic ice soundings 2. Greenland ice thickness 3. Greenland Ice C 4. Greenland.**—*Authors' abstract.*

10.5–134 551.509.329:551.311.181(261.

†Goedecke, Erich, **Neuere Untersuchungen über die Vorbereitungs- und Abschmelzze des Eises in der Deutschen Bucht und westlichen Ostsee.** [Recent investigations into t pre-freezing and pre-melting period of sea ice in the Heligoland Bight and the Western Baltic *Annalen der Meteorologie*, Hamburg, 8(3/4):80–92, **1957.** 4 figs., 3 tables, 27 refs., 6 eq **DWB, DLC**—Various methods were developed, particularly in the Scandinavian countrie to calculate the first day on which ice appeared and the time when ice disappears in harbo and on sailing routes. The forecasting methods of PALOSUO, ÖSTMAN, RODHE, LISITZIN, et are summarized in detail and some prediction equations are presented. Using the extensi data of daily 8 o'clock reports of ice observation stations for the winters 1920–21 to 1952– available from Germany, Denmark, etc., and daily temperature means, the author determin for each winter the pre-ice period and the pre-melting period. For each station the media and the mean errors of the medians were computed and a large scale comparison of pre-i appearance period and pre-melting periods for the German Bight and western Baltic w made. Tables giving the mean pre-ice and pre-melting periods and maps showing temperatu conditions during specific periods are presented. The weather conditions associated wi ice formation and ice melting are analyzed. *Subject Headings:* **1. Sea ice formation forecasti 2. Sea ice melting 3. Ice breakup forecasting 4. Heligoland Bight 5. Western Balt** —*I.L.D.*

10.5–135 551.509.33:551.311.1(98

*U. S. Hydrographic Office, **Long-range ice outlook, SUNEC area and eastern portion Project 572, 1958.** Its *H.O. Misc.* 15869-15, **1958.** 29 p. 18 charts. **DWB** (551.3 U583Lse)—An outlook of expected sea-ice conditions in the eastern North American Arct is presented for the period mid-May through mid-September 1958. The outlook, based relationships between the environmental factors and ice growth and drift, includes a detail discussion and monthly prognostic charts of the expected ice conditions. Opening dates f various sites in the area are also presented. The oceanographic data obtained during autu 1957 and climatic data accumulated during the past winter are analyzed with reference ice growth and drift during the winter period. In addition observed ice conditions for t period March 20 through 31, 1958 are presented. In general, ice conditions are expected to favorable along the Labrador coast, approximating those of 1953. Conditions in Baffin B are expected to be more favorable than last year in the eastern part and about the same

t year in the western part. Foxe Basin is expected to exhibit ice conditions less formidable n in 1957. Average ice conditions are indicated for east Greenland. *Subject Headings:* **Long range ice forecasting 2. North American Arctic.**—*Author's abstract.*

10.5–136 551.509.33:551.311.1(987)

*U. S. Hydrographic Office, **Long-range ice outlook, Western and Central North American tic, 1958.** Its *H.O. Misc.* 15869-16, **1958.** 23 p. 15 charts. **DWB** (551.311 U583Lwc)—outlook of expected sea-ice conditions for the central and western North American Arctic resented for the period mid-June through mid-Sept. 1958. The outlook, based on relationps between the environmental factors and ice growth and drift, includes a detailed discussion l monthly prognostic charts of the expected ice conditions. The oceanographic data ained during autumn 1957 and the climatic and ice data accumulated during winter 1957–58 evaluated for their effect on sea-ice disintegration and distribution. In addition, charts icating observed ice conditions for the period May 2–22, 1958 and historical ice freezeup rmation are presented. In general ice conditions are expected to be favorable from Bering ait to Point Barrow, approximating those observed in 1957. East of Point Barrow to rchel Island conditions are indicated to be more severe than 1957, but better than normal. m Herchel Island to Shepherd Bay, generally more favorable conditions than last year l be encountered. *Subject Headings:* **1. Long range ice forecasting 2. North American tic.**—*Author's abstract.*

10.5–137 551.311.18:539.89

Uusitalo, S. (*Inst. of Marine Res., Helsinki*), **Beobachtungen mit Bezug auf das Meereseis.** bservations on sea ice.] *Geophysica*, Helsinki, 5(3):139–146, **1957.** 5 figs., 3 refs., **DLC**—thods of determining the salt content of ice on the Finnish coast line are described and cussed. It is shown that the salt content is not high, and it varies between 0–2.5% at erent depths of the ice. *Subject Headings:* **1. Salt content of ice 2. Finnish Coast.**—*A.M.P.*

10.5–138 551.311.1:620.173

Sala, I., **Einige Messungen der Eisfestigkeit.** [Some measurements of the strength of] *Geophysica*, Helsinki, 5(3):150–152, **1957.** fig., table. **DLC**—Methods and results a study of the structure of sea ice, its physical properties and compressive strength, carried at the Institute of Sea Research in Helsinki, are described and presented in a table. The ssure experiments were carried out in vertical and horizontal directions with a "field pressure paratus" made in Canada. *Subject Headings:* **1. Strength of ice 2. Ice pressure 3. Helki.**—*A.M.P.*

10.5–139 551.311.181(268)

Weeks, W. F. and Anderson, D. L. (*both, G.R.D., A.F. Camb. Res. Center, Mass.*), **Sea ice ust structures.** *Journal of Glaciology*, London, 3(23):173–175, March **1958.** 4 figs., ref. glish and German summaries p. 173. **DWB, DLC**—At Hopedale, Labrador, recently, l sea ice structures were observed in open leads to the edge of the fast ice, and also during ial freezing of Wolstenholme Fjord, Greenland (3 aerial photographs show these remarkable ictures). Similar structures were seen by J. E. Oliver during flights over Beaufort Sea March–April 1951. The "rafting" occurs only where there is extremely thin sheet ice 6 cm thick) and it is 0.1 to 1.0 m wide and 40–100 m long. Oliver reported some 600 m g. Most are 90° angle to ice edge and the maximum dimension is parallel to the wind at e of formation. New ice is very saline and flexible. This accounts for its keeping its icture when a wind shift splits up sheets of ice and forces them back against the shore ice. ction must be very small, and lubrication by very salty water great. Wave action assists he thrusting. *Subject Headings:* **1. Sea ice thrust structures 2. Labrador Coast 3. Wolnholme Fjord, Greenland. I. Oliver, J. E.**—*M.R.*

10.5–140 551.501:551.311.1

Tarapygin, P. P., **Statsionarnaia ledomernaia reĭka.** [Stationary ice-measuring rod.] *eorologiia i Gidrologiia*, Leningrad, No. 10:41–42, Oct. **1957.** fig. **DWB, DLC**—With aid of a diagram, the author describes the construction and use of a rod for measuring ice

thickness without disturbing the ice cover. A metallic or wooden tube, somewhat long than the assumed thickness of the ice at the point of measurement, is used. Into the tube wooden measuring rod with a bracket is inserted. The rod is fastened to the tube with wooden collar. The device is set up at the beginning of winter; an opening is made in the i and the tube is inserted perpendicular to the current. The measurement of the thickness the ice sludge, etc., is described. *Subject Heading:* **1. Ice thickness measurement technique** —*I.L.D.*

10.5–141 551.311.1

Plashchev, A. V., **Vzryv ledianogo bugra.** [Bursting of ice mounds.] *Priroda*, Mosco No. 9:113, Sept. **1956. DLC**—The author describes some forms of ice mounds formed ice observed on rivers of the Upper Kolyma and the bursting of such ice mounds. It is su gested by the author (citing M. I. SUMGIN) that this bursting was caused by the freezing supercooled water within the mound. A slight trembling of the ground produced, for examp by a passing train would suffice to make the frozen ground vibrate so that supercooled wat would be transformed into ice. The accompanying expansion on freezing is the immedia cause of the bursting. *Subject Headings:* **1. River ice structure 2. Ice mound burstin** —*I.L.D.*

10.5–142 551.311.1:539.

Olkkonen, Eero (*State Inst. of Tech. Res., Helsinki*) and Palosuo, Erkki (*Inst. of Mari Res., Helsinki*), **A resistance gauge for measurement of ice pressure.** *Geophysica*, Helsin 5(4):221–225, **1958.** 3 figs., 2 refs. **DWB, DLC**—The new resistance gage for measuring i pressure at any point such as on a dam wall in the middle of a lake or in a glacier is describ and illustrated. It has a steel membrane with a strain gage glued on its back so that t bending of the membrane stretches the gage and the pressure can be then measured with standard bridge. The gage was tested in the sea ice near Helsinki 200 m from shore on Mar **5, 1957.** Pressure increased as the ice froze from 16 cm to 28 cm depth and there was increase of pressure even on the day following its installation. Pressure increased great as the cold grew intense and then decreased nearly to zero. *Subject Headings:* **1. Ice pressu gages 2. Helsinki, Finland.**—*M.R.*

INDUSTRIAL METEOROLOGY

10.5–143 551.586:639.

Alkire, H. L. (*U. S. W. B., Baltimore, Md.*), **Chesapeake Bay oysters.** *U. S. Weath Bureau, Weekly Weather and Crop Bulletin*, 43(8):5–8, Feb. 20, **1956.** 5 figs. **DWB, DLC** The author describes oyster development stages and the effects of weather on the oys growth and spawning. Map of Chesapeake Bay salinity is included. Annual graphi representation of the smoothed average water temperatures at Solomons, Md. (period 1937–4 shows that most oysters spawn at 68°F or above and feed at 41°F or above. *Subject Headin* **1. Weather effects on oyster growth 2. Water temperatures 3. Oysters 4. Chesapea Bay.**—*N.N.*

10.5–144 551.509:639.2 551.579

Andreev, N. K., **Gidrometeorologicheskoe obespechenie rybnoĭ promyshlennosti Severnom Kaspii.** [Hydrometeorological service to the fish industry in the N. Caspian Se *Meteorologiia i Gidrologiia*, Leningrad, No. 10:34–35, Oct. **1957. DWB, DLC**—Spec examples showing how the hydrometeorological service aids the fishing industry on the Casp Sea are presented. In 1953 the Astrakhan Hydrometeorological Bureau forecast, 5 days advance, the possibility of ice formation on the fishing grounds from Oct. 26 to Oct. 27. the morning of Oct. 27 ice began to form in the rough part of the sea and on subsequent da the ice began to extend in depth; other instances are cited. Various specialists from hydrometeorological service in the Astrakhan Oblast confer with officials of the fishing indus in the planning of the seasonal fishing campaigns. *Subject Headings:* **1. Fisheries weath**

recasting 2. Fishing industry 3. Ice formation 4. Hydrometeorological services 5. Caspian Sea.—*I.L.D.*

10.5–145 551.5:622.363.1

Baldacci, Osvaldo, **La salina di Tarquinia.** [The salt works of Tarquinia.] *Società eografica Italiana, Bollettino,* Ser. 8, 9(6/8):264–299, June/Aug. 1956. 12 figs. (incl. photos), refs., bibliog. **DWB, DLC, NNA**—Detailed description of the history, construction and eration of the Tarquinia salt works where sea water is captured and evaporated during the mmer season. The influence of meteorological elements (temperature, rainfall distribution, aporation, wind) upon salt production is discussed. Mean monthly rainfall amounts for o stations (1921–1950) and monthly total precipitation amounts for three stations (1951–55) in and near Tarquinia are presented. *Subject Headings:* **1. Salt production 2. Tarquinia, aly.**—*G.T.*

10.5–146 551.524.36:381.14

McGuire, J. K. (*Northeast Area Climatologist, Weather Bureau Office, N. Y.*), **Feeding ew York City.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin,* 43(46):7–8, Nov. , 1956. **DWB, DLC, DA**—This is a general description of how weather affects the New ork City market. Heat wave induces New York's 15 million inhabitants to be highly lective in their purchases of foods. Both the farmers and the consumers must use weather formation intelligently. *Subject Headings:* **1. Heat wave effects on consumer selectivity of od 2. Sales meteorology 3. New York City.**—*N.N.*

10.5–147 551.526.6:639.2

Hamada, Y., **On the catch of yellowtails from a meteorological viewpoint.** *Japan. eteorological Agency, Memoirs of Industrial Meteorology,* 21(2):113–126, **1958.** fig., 8 tables. t Japanese; English summary p. 126. **DWB**—Fishing for yellowtails is actively carried on in e Sea of Kumano off the southern district of Mie Prefecture, but the catch seems to be poor tely. The author investigated the relationship of this poor catch to sea water temperature, ansparency, wind direction and pressure distribution. Results obtained are as follows: he most suitable water-temperature for the catch seems to be 17°C and in this regard it is portant to know the conditions of the main current of Kuroshio, coastal current, surface d bottom currents. In fact, any correlation is hardly recognized between water temerature and land air-temperature, and water-temperature seems to be controlled by the rrent conditions. Transparency of 15 m seems to be most suitable for the catch, and traordinarily good transparency, after continued calmness or large turbidity rather makes a or catch expected. As the catch is closely related to water changes, one must take notice the situation and passage of a cyclone or a front. *Subject Headings:* **1. Fishing 2. Sea mperatures 3. Weather effects on fishing 4. Kumano Sea.**—*Author's abstract.*

10.5–148 539.1:621.039

Hess, H. H. (*Dept. Geol., Princeton, N. J.*) and Thurston, W. R. (*Nat'l. Acad. Scien., Vash., D. C.*), **Disposal of radioactive waste on land.** *American Geophysical Union, Transtions,* 39(3):467–468, June **1958.** ref. **DWB, DLC**—Two years' consideration of the sposal problem by the National Research Council Committee on Waste Disposal has led certain conclusions which are presented. Waste may be safely disposed of at many sites the U. S. but conversely there are many large areas in which it is unlikely that disposal tes can be found as, for example, the Atlantic seaboard. The research to ascertain feasibility disposal has for the most part not yet been done. The most practical immediate solution the problem suggests disposal in cavities mined in salt beds or domes. Disposal could be eatly simplified if the waste could be gotten into solid form of relatively insoluble character. isposal in porous beds underground has capabilities of taking large volumes but will require nsiderable research to make the waste compatible with such an environment. The main ifficulty with this method at present is to prevent clogging of pore space as waste is pumped in. *ubject Heading:* **1. Radioactive waste disposal.**—*Authors' abstract.*

10.5–149 551.5:665.

Booth, A. W. (*Illinois Univ.*) and Taylor, E. F. (*DeGolyer and MacNaughton, Dallas*) **The petroleum industry.** *Meteorological Monographs* (American Meteorological Society, Boston, 2(9):96-103, May **1957.** table, 13 refs. **DWB, DLC**—In this discussion of the effec of weather extremes upon the petroleum industry, including petroleum exploration, drillin operations, oil well production, petroleum transportation and petroleum storage is limite almost entirely to conditions prevailing in four general Northern Hemisphere environment the Tundra, the taiga, the middle latitude steppe and high altitude mountain and platea areas in middle latitudes. The limiting effects of the following weather elements: low tem perature, wind velocity, permafrost, frequent freeze and thaw conditions are described. brief account of the effect of hot summer climates on the various operations of the petroleu industry is included. *Subject Headings:* **1. Weather effects on oil industry 2. Weathe extremes 3. Oil industry.**—*I.L.D.*

10.5–150 551.577.21:633.5

Queiroz, Dario Xavier de, (*Serviço Meteorológico de Angola, Luanda*), **Pluviosidade produção de algodão no Concelho de Icolo e Bengo.** [Precipitation and cotton productio in the Icolo-Bengo District.] (In: Angola. Servico Meteorològico, **Miscelanea geofisic** Luanda, **1956.** p. 324–332. 5 tables, 4 refs., 2 eqs. **DWB** (M(08) A592mi)—The autho establishes a correlation between the precipitation and the cotton production in the Icol Bengo District (some 50 km southeast of Luanda). From that correlation is derived th regression equation presented. *Subject Headings:* **1. Precipitation effects on cotton 2. Cotto 3. Angola.**—*Author's abstract.*

10.5–151 551.5:331.8

Schloemer, R. W. (*U. S. W. B., Office of Climatology*), **Your vacation and the weathe** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 43(24):8, June 11, **1956. DL DWB, DA**—A few points are raised on how weather affects vacations. The reader is e couraged to learn about weather and climatic conditions and then to use them to advantag *Subject Heading:* **1. Weather effects on vacations.**—*N.N.*

10.5–152 551.5:361

Smith, De Witt (*American National Red Cross, Wash., D. C.*), **Disasters and disast relief.** *American Academy of Political and Social Science, Annals*, 309:1–169, Jan. 195 figs., tables, refs. **DWB.** (Articles abstracted separately. For listing of contents, *see* P III, 8(7):1004, July 1957, *MAB.*)—This issue contains 17 articles on various aspects of floo hurricane, tornado wind, earthquake and other disasters and the function of the Governme and of relief agencies and volunteer workers, plus a case history of the coordinated working all of these agencies (Yuba City flood, Calif., Dec. 1955). Articles by Hoyt Lemons, F. W Reichelderfer, L. Don Leet and others, on floods, hurricanes, earthquakes, public heal problems, insurance, etc., are abstracted separately. *Subject Headings:* **1. Disaster reli 2. Weather disasters 3. Hurricane relief 4. Flood relief.**—*M.R.*

10.5–153 551.48:621.0

Bryant, G. T. and Geyer, J. C. (*both, Johns Hopkins U., Balt., Md.*), **The travel time radioactive wastes in natural waters.** *American Geophysical Union, Transactions*, 39(3):44 445, June **1958.** 5 figs., 17 refs. **DWB, DLC**—Radio isotopes discharged into natural wate (1) precipitate and settle, (2) adsorb on suspended and fixed surfaces, (3) enter the biolog cycle, or (4) in solution move with the flowing, mixing water itself. In the course of its li a single nuclide may shift with more or less freedom back and forth among these alternat The paper deals with phenomena related to the fourth alternative. Natural waters and t substances carried in solution move and mix in response to complex forces of gravity, win tide, density, impact, shear, and inertia. Past studies of mixing and movement are draw on to depict the time and space distribution of radioactive contaminates in natural wate Tracer studies offer means for evaluating mixing and travel time which may in turn be us to forecast the fate of wastes continuously disposed of in water. *Subject Heading:* **1. Radi active wastes in water.**—*Authors' abstract.*

10.5–154 551.521.1:551.556.3:620.91

Golding, E. W., **The combination of local sources of energy for isolated communities.** *olar Energy: the Journal of Solar Energy Science and Engineering*, Phoenix, 2(1):7–12, Jan. 958. 3 figs., 6 tables. **DWB**—This article emphasizes the importance of a supply of energy or the improvement of living conditions in and general development of, underdeveloped areas. he costs of importing energy, whether in electrical form or as fuels, are usually expensive for ich areas because of their remoteness from bulk supplies with consequent high costs for ransport. It is suggested that, to supply power to isolated communities scattered over a ide area and with a consequent low density of population, local sources of energy should be sed. The most widely distributed local resources are wind, solar radiation, and organic aste materials. The methods of using these by means of equipment now under development re described, and the probable costs involved are also estimated. As a conclusion, the rticle outlines a possible scheme for the combination of local energy resources to supply all he energy needs of a community in an underdeveloped area. *Subject Headings:* **1. Energy ources 2. Solar energy 3. Wind energy.**—*Author's abstract.*

10.5–155 551.5:6

Chi, C. H., **A general discussion of meteorology in applied fields.** *Meteorological Bulletin*, aipei, Formosa, 3(2):25–32, June **1957.** 29 refs. In Chinese; English summary p. 25. **DLC** (Orientalia)—This paper gives a general description of applied meteorology. It includes ome items such as the results of wars effected by the weather, the relations between agri- ulture and climate, and the latest development in the industrial and commercial weather ervices, etc. *Subject Heading:* **1. Applied meteorology.**—*Author's abstract.*

MEDICAL METEOROLOGY

See also: **Cold injury and military bioclimat.** (Whayne), 10.5–19; **Vasomotor reflexes and environmental physiology** (Kamiyama), 10.5–325; **Weather effects on cardiac infarction** (Petr, Picko), 10.5–326; **Clothing climate** (Woodcock et al., 10.5–329.

10.5–156 551.586:612.79

Barrueto, R. B.; Mager, M. and Bass, David E., **Measurement of the rates of excretion f sweat solutes under physiological conditions.** *U. S. Quartermaster Research and Engineering Center. Environmental Protection Research Div., Technical Report*, EP-78, Dec. **1957.** 9 p. figs., table, 7 refs. **DWB** (M86 U585t)—An apparatus for studying the rate of excretion f sweat from an arm under various skin temperatures is described and illustrated. A copper ylinder, with air circulating through it so as not to alter the humidity of the environment, s used in connection with a system for trapping and measuring the constituents of the sweat. Results with constant temperatures of 80–82°F and 95–120°F at different times, are summa- ized. Copper-constantan thermocouples are used to measure skin temperatures. *Subject Headings:* **1. Sweat measurement apparatus 2. Skin temperatures.**—*M.R.*

10.5–157 551.524:551.586:612.014.43

Baker, Paul T., **American negro-white differences in heat tolerance.** *U. S. Quarter- naster Research and Engineering Center. Environmental Protection Research Div., Technical Report*, EP-75, June **1958.** 15 p. fig., 10 tables, 25 refs. **DWB** (M86 U585t)—The physio- ogical responses of American white and negro soldiers were studied under hot-wet and hot-dry conditions. Under hot-wet conditions 40 pairs of men matched for body fat, weight, and stature were walked around a course at 3½ mph for one hour. Under hot-dry conditions 8 pairs of men also matched for body fat, weight, and stature were studied under 8 different conditions which included combinations of clothing, sun, shade, walking, and sitting. The results of this series of experiments indicated: 1) under hot-wet conditions with both Negroes and Whites clothed and walking, the Negroes had a higher physiological tolerance. 2) under hot-dry conditions with both groups nude and exposed to the sun, sun-tanned Whites had the higher tolerance. These results further suggested that the differences found were not a function of transient environmental effects and are mostly genetic in origin. *Subject Headings:* **1. Heat tolerance 2. Racial differences in heat tolerance.**—*Author's abstract.*

10.5–158 551.501.721:551.521.17:616.

Generalov, A. A., **K kharakteristike shchavelevskogo metoda izmereniia ul'trafioletovo radiatsii.** [Characteristics of the sorrel method of measuring UV radiation.] *Gigiena Sanitariia*, 21(10):15–20, Oct. **1956.** 4 figs., table, 5 refs. **DLC**—The author investigated the sensitivity of the oxalic acid method to various ultraviolet wave lengths. Examination of various solutions of oxalic acid show that its spectral sensitivity is far from that of the erythemal sensitivity of the skin. Evidence is presented that the erythemal equivalent analyzed by means of oxalic acid is not uniform. The use of this technique is not recommended. *Subject Headings:* **1. Ultraviolet radiation measurement 2. Erythema light sensitivity 3. Skin sensitivity.**—*I.L.D.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Noctilucent cloud obs. manuals** (Grishin), 10.5–39; **Training courses in met.** (Neuberger, Teweles), 10.5–80; **Hist. of Czechoslovak met.** (Maňák), 10.5–85; **Ice thickness meas. techniques** (Tarapygin), 10.5–140; **Skin sensitivity meas.** (Generalov), 10.5–158; **Carbon dioxide meas.** (Callendar), 10.5–201; **Radar analysis of typhoon rainfall** (Ushijima), 10.5–238; **Regression equations and wind correlation calculation** (Court), 10.5–274; **Radar observation of auroras** (Seed), 10.5–342.

10.5–159 551.501.45:517.9

Gandin, L. S., **O lineĭnoĭ interpoliatsii meteorologicheskikh elementov v dvukh izmereniiakh.** [Linear interpolation of meteorological elements in two dimensions.] *Leningrad Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 71:163–168, **1957.** fig., 3 refs., 27 eqs. **DWB** (M(055) U581tG)—The equation for linear interpolation of a meteorological element located between two points and for the mean square of such interpolation (as determined by the formula of O. A. Drozdov and A. A. Shepelevskiĭ, *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Trudy Nauchno-Issledovatel'skikh Uchrezhdeniĭ, Ser.* 1 (*Meteorologiia*), No. 13 (about **1945**) are presented. This is followed by a mathematical analysis of linear interpolation in two dimensions and the errors involved, and the application of the equation obtained to the interpolation of barometric pressure is illustrated. *Subject Heading* **1. Linear equations 2. Linear interpolation.**—*I.L.D.*

10.5–160 551.501.45:551.579.4:627.1

Kalinin, G. P. and Miliukov, P. I., **O raschete neustanovivshegosia dvizheniia vody v otkrytykh ruslakh.** [Calculation of the unstable movement of water in open channels.] *Meteorologiia i Gidrologiia*, Leningrad, No. 10:10–18, Oct. **1957.** fig., 13 refs., 23 eqs. **DWB DLC**—The calculation of the unstable movement of water in a channel by the method of characteristics and of multiple regimes is difficult and time consuming. Instead the approximate solution of the problem on the movement of flood waves in the case of two limiting conditions namely

$$\frac{dH}{iyds} \to 0 \quad \text{and} \quad iy \approx 0 \quad i.e. \quad \frac{dH}{iyds} \to \infty$$

is used in hydrological forecasts and computations. Under the first condition the motion of the waves in the channel is calculated when the magnitude of the additional slope dH/ds is small in comparison with the stable regime iy and in further flattening out, the waves can be neglected. The formulas of Kleitz-Velikanov or the simultaneous solution of the equation of continuity and of the curve of volumes $W=f(\bar{Q})$ where $\bar{Q}$—mean discharge in a section are used. In the second condition waves passing through a reservoir are computed; the equation of movement is replaced by $\bar{Q}=f(W)$. The use of this procedure in computing the following and of waves in channels is illustrated. The system of equations

$$W_1 = W_0 + \bar{q}_{pr}\Delta t_1 - \frac{Q_0+Qi}{2}\Delta t \quad \text{and} \quad Q = \frac{1}{r}W$$

where q—arrival of water to the section through the upper course, Q—discharge of water through the lower course of the section and τ—time during which the volume of water flows through the lower course) is solved for a specific instance in the lower course of the Dvan'kov hydroelectric Station. The method of solution and the accuracy of the results obtained are discussed. *Subject Headings:* **1. Unstable water movement in channels 2. Flood wave analysis 3. Wave motion 4. Hydrodynamics of rivers.**—*I.L.D.*

10.5–161 551.501.45:519.2

†Obukhov, A. M., **Statisticheskoe opisanie nepreryvnykh polei.** [Statistical description of continuous fields.] *Akademiia Nauk SSSR. Geofizicheskii Institut, Trudy*, No. 24(151):1–22, **1954.** 3 figs., 28 refs., 106 eqs. **DLC.** Trans. into English available. **DWB** (M51 144st)—This study is a systematic presentation of the theory of random fields—both scalar and vector. It contains mathematical analyses of the probability distribution of random functions, application of the method of movements to the statistical description of continuous fields, resolution of random functions into noncorrelated constituents, statistically homogeneous and isotropic fields, potential and solenoidal vector fields, structural functions of statistically homogeneous random fields and the law of large numbers for continuous processes. The application of this theory to turbulence studies is stressed. *Subject Headings:* **1. Random variables 2. Statistics in meteorology 3. Turbulence theory.**—*I.L.D.*

10.5–162 551.501.75:551.553.11

Dexter, R. V. (*Met. Service of Canada*), **The sea-breeze hodograph at Halifax.** *American Meteorological Society, Bulletin*, 39(5):241–247, May **1958.** 9 figs., 4 refs. **DWB, DLC**—The surface winds at Halifax, N. S., are averaged vectorially for each hour by months over a period of 16 years. The end points of the resultant wind vectors are plotted to show the average daily hodograph for each month during the sea-breeze season, i.e., from May to Sept., inclusive. The hodographs do not conform to accepted theory in that they are not ellipses. Reference is made to the topography of Halifax in an attempt to explain a persistent departure from elliptical shape. The magnitude of the average sea breeze at Halifax is discussed and a probable maximum value determined. This value is so small that the application of the hodographs to the problem of forecasting the sea breeze in a particular synoptic situation is difficult. *Subject Headings:* **1. Sea breeze hodographs 2. Halifax, N. S.**—*Author's abstract.*

10.5–163 551.501.75:551.557.2:518.4

Nania, Abele, **Un traiettografo.** [A trajectograph.] *Rivista di Meteorologia Aeronautica*, Rome, 18(1):35–39, **1958.** 5 figs., eqs. Italian, French, English and German summaries p. 35. **DLC**—A special nomogram and slide rule is shown and described for calculating and tracing on maps the constant vorticity trajectories. The trajectograph consists of the nomograph, movable alidade for velocity V at 06h, a slide for ΔD at 06h, and another slide of plexiglass for ΔD. The graduations of the alidade and slide are made to fit geographic charts of one to 10, 15 and 20 million, respectively. Examples of trajectories for W. Europe using the Bellamy nomogram, the table and the trajectograph for 24 hr and 48 hr movements are shown. Forecast and actual movements agree fairly well. *Subject Headings:* **1. Trajectographs 2. Constant vorticity trajectory slide rules 3. Nomographs.**—*M.R.*

10.5–164 551.501.8:551.594.5

†Collins, C., **Some observations of aurora using a low-power frequency-modulated radar.** *Canadian Journal of Physics*, Ottawa, 36(7):926–934, July **1958.** 5 figs., table, 18 refs. **DWB, DLC**—A frequency-modulated, continuous-wave radar seems to be particularly well suited to the observation of auroral ionization, since it provides both range information and a Doppler indication of radial motion. An experimental equipment of this type has been operated for a few months near Ottawa. The system parameters are briefly considered and the radar observations are compared with similar measurements made with higher-powered pulse systems. *Subject Heading:* **1. Radar observation of auroras.**—*Author's abstract.*

OBSERVATIONAL DATA

See also: **IGY, 1957–1958,** 10.5–42; **Japanese participation in IGY,** 10.5–43; **IGY met. program and data center** (Ashford), 10.5–46; **Polish participation in IGY** (Olczak), 10.5–47; **Canadian participation in IGY,** 10.5–48; **IGY astronomical and geodetic program, Delft, Netherlands** (Roelofs), 10.5–50; **IGY** (Chapman), 10.5–51; **U. S. participation in IGY** (Odishaw), 10.5–52; **Soviet IGY program,** 10.5–53; **IGY program, Belgian Congo** (Van Straelen), 10.5–54; **Tropopause data, Arctic** (Gaïgerov), 10.5–57; **Antarctic expeds., Adélie Land** (Prudhomme, Valtat), 10.5–60; **Historic temp. records, Germantown, Pa.** (Havens), 10.5–86; **Hist. of met. obs., Poland** (Rojecki), 10.5–88; **U.S.S.R. satellites** (Schilling et al.), 10.5–111 to 10.5–116.

10.5–165 551.506.8:634.9

Koyano, M. and Momose, N., **The forecast of the colouring of maple-trees.** *Japan Meteorological Agency, Tokyo, Memoirs of Industrial Meteorology,* 21(1):29–31, **1957.** 2 figs., table. In Japanese; English summary p. 31. **DLC**—The authors have examined the color change dates of maple trees at Takayama, Nagano, Matsumoto, Kofu, Maebashi, Utsunomiya Mito, Kumagaya and Shirakawa. It is found that the primary meteorological factor affecting the coloring of maples is the grand total of daily minimum temperatures from Sept. 16 to Oct. 5. An equation is presented for the forecasting of the color-change date: $Y=0.33X-66$ where Y is the estimated color-change date, the initial date is reckoning before Oct. 1, and X the total of daily minimum temperatures in the period from Sept. 16 to Oct. 5. *Subject Headings:* **1. Phenological forecasting 2. Maple trees 3. Japan.**—*Authors' abstract.*

10.5–166 551.506.8:634.23(52)

Sakamoto, T., **On the dates of full blooming of cherry trees in the Noto Peninsula** *Japan. Meteorological Agency, Memoirs of Industrial Meteorology,* 21(2):127–129, **1958** 5 figs., 2 refs. In Japanese; English summary p. 129. **DWB**—In order to get a knowledge of the climate of the Noto Peninsula in detail, the author tentatively uses the dates of full blooming of cherry trees. The observations of the dates were made at 47 primary schools distributed over the Noto Peninsula, about 10 km distant one from another. The results are as follows: 1) the isochrones showing equal dates of full blooming closely resemble isothermal lines in pattern, so that the monthly mean temperature of March and April may be inferred for any point from the isochrones of full-blooming; 2) the lag of full blooming with elevation is about 4 days per 100 ms. This value is rather striking compared with those obtained already for several districts of Japan. It would be attributed to the large lapse rate of temperature in early spring, especially in the lowest friction layer; 3) making use of the above relations, the isochrones of full blooming corrected to sea level were drawn. Considerable difference is seen from place to place, even in such a small peninsula as this. *Subject Headings:* **1. Phenological observations 2. Cherry trees 3. Noto Peninsula, Japan.**—*Author's abstract.*

10.5–167 551.506.8:581.143.26:551.501:551.510.7

Unger, K., **Zur Anwendung der Durchstrahlungsmethode für phänometrische Messungen mit Hilfe von radioaktiven Strahlungsquellen.** [Application of the radiation penetration method for phenological measurements with the help of radioactive sources.] *Angewandte Meteorologie,* Berlin, 3(4):115–118, June **1958.** 4 figs., 7 refs. **DLC**—In order to qualify phenological observations, the author proposes the use of radioactive isotopes for determining accurately the weight increase of plants during growth. In this method, the plant is irradiated by radioactive cobalt and the radiation penetration method determines the plant mass by means of absorption of γ rays. The experimental procedure involving the method of radiation and measurement of radiation are described with the aid of photographs and a circuit diagram of the scintillation counter. The radiation per experimental plot was measured at 5 cm height. A measurement of 65 cm height was used as a measurement of atmospheric absorption. The radiation absorption value was computed from the difference between impulse rate and the radiation penetration rate. The absorption rate can be expressed in fresh weight values of the stand. The maximum measurement accuracy is ± 10 g of the weight difference. Also the possibility of measuring dew and moisture amount of the plant stand is discussed. *Subject Headings:* **1. Radiation penetration method 2. Plant weight increase 3. Radioactive isotopes 4. Phenological observations.**—*I.L.D.*

10.5–168 551.506.8:551.577:581.03

Vollprecht, R. and Walker, D. R. (*both, Divisional Office, Perth*), **Determination of the length of the growing season.** *Australian Meteorological Magazine*, Melbourne, No. 17:37–46, June **1957.** 3 figs., 5 refs. **DWB**—The average dates of opening and close of the growing season are determined for PERTH and KELLERBERRIN by three methods. Each of these methods uses the effective rainfall and the rainfall recorded at the stations, but in two cases the methods are graphical using monthly and daily data, whilst the third method involves statistical analysis by least squares. A tabulation of results shows close agreement between dates by the different methods. It is thus demonstrated that for certain purposes the use of monthly averages gives results in close agreement with those obtained from daily averages. *Subject Headings:* **1. Length of growing season 2. Phenological studies 3. Rainfall influences.** —*Authors' abstract.*

10.5–169 551.506.8(84)

*Bolivia. Servicio Meteorológico, **Boletín Anual Meteorológico.** [Annual Meteorological Bulletin], **1956.** Issued **1958.** 50 p. Almost entirely tables. On cover-title: *Anuario Meteorológico.* **DWB** (M06./84 B689ba)—A compilation of monthly and annual data on temperature and precipitation data for nearly 60 stations in Bolivia (30 with wind, pressure, and humidity), and an equal number of precipitation stations (by months). Evaporation data are given for 5 stations (mean and maximum evaporation for each month). Graphs show annual course of mean temperature. *Subject Headings:* **1. Annual meteorological data reports 2. Bolivia.**—*M.R.*

INSTRUMENT CARRIERS

See: **Rocketry and astronometers** (Burgess), 10.5–20; **U. S. IGY rocket program,** 10.5–44; **Satellite tracking,** 10.5–49; **Satellite tracking** (Lemmens), 10.5–108; **Satellite tracking** (Oblakov), 10.5–109; **U.S.S.R. satellites** (Schilling et al.), 10.5–111 to 10.5–116; **Glider flights, Switz.;** 10.5–124; **Rocket pressure instruments** (Spencer et al.), 10.5–170; **Artificial ion clouds (NO)-** (Pressman et al.), 10.5–291; **special bibliog. on Ozone,** p. 759.

INSTRUMENTS

See also: **Radiosonde manuals** (Khakhalin), 10.5–40; **Training courses in met.** (Neuberger, Teweles), 10.5–80; **Hist. of radiosonde** (Vukmirović), 10.5–84; **Barographs** (Chilton), 10.5–87; **Soot meas. in atmos.** (Mrose), 10.5–202; **Energy budget and sonic anemometers** (Suomi), 10.5–223; **River gages** (Koffman), 10.5–314.

10.5–170 551.508.4:551.507.362.1

Spencer, N. W.; Boggess, R. L.; Brace, L. R. and El-Moslimany, M. A., **A radioactive-ionization-gage pressure-measurement system.** Michigan. Univ. Engineering Research Institute, Contracts AF 19(604)-545, AF 19(604)-1511 and AF 19(604)-1948, Scientific Report, No. ES-1, May **1958.** 61 p. figs., tables, 6 refs. **DWB** (M08.4 M624sc). Also issued in summarized form in its Scientific Report, No. ES-2, Sept. **1958.** 3 p. 8 figs.—An air-pressure-measurement system employing a radioactive ionization gage has been developed for use in rockets for the determination of surface pressures which can be interpreted in terms of the ambient pressure, density, and temperature of the atmosphere. The system has proven useful for the measurement of pressure from atmospheric to at least 10^{-3} mb. Details of apparatus, separate parts and circuits are outlined and illustrated in this report. *Subject Heading:* **1. Rocket pressure instruments.**—*Authors' abstract.*

10.5–171 551.508.41

Eberlein, A. J. (*Minneapolis-Honeywell Regulator Co.*), **Laboratory pressure measurement requirements for evaluating the air data computer.** *Aeronautical Engineering Review*, N. Y., 17(4):53–57, April **1958.** 5 figs., table, 3 refs. **DLC**—The ADC (air data computer) requires pressure readings to 0.25% and this in turn requires a carefully controlled U-tube mercury barometer which can be kept in a chamber controlled to 0.05°C and this chamber in a larger temp. controlled chamber or room. The determination of tolerances, types of aerometers used and accuracy required at altitudes up to 100,000 ft are discussed and the latter shown on a graph. The accuracy of present equipment in another case (accurate to only .0075 "mercury

at 75–100 thousand feet compared with required .002" to achieve the .25% accuracy) and th estimated cost vs. accuracy [it may cost $130,000 ($5000 per pressure source and require 1 minutes per determination or 3 days to make 150 pressure determinations)] are also discusse and shown graphically. *Subject Headings:* **1. Mercury barometer accuracy 2. Air Dat Computer (ADC) pressure requirements.**—*M.R.*

10.5–172 551.508.5

Ling, S. H., **Errors in single-theodolite pibal observation.** *Meteorological Bulletin* Taipei, Formosa, 3(2):10–16, June **1957.** 2 figs., 3 tables, 11 refs., 46 eqs. In Chinese English summary p. 10. **DLC** (Orientalia)—Expressions giving the errors in the balloo ascent rate, the horizontal distance, and the observed wind speed and direction are derived It is found that the ascent rate is more sensitive to inflation errors than to variations in th mass of the balloons. The error in the horizontal distance increases with the increase o altitude and the decrease of elevation angle, and low elevation angles usually introduce seriou errors. The error arising from the neglect of the earth's curvature is also investigated, an a simple correction is given. Finally, it is found that the smaller the elevation angle or/an the lighter the wind, the greater the error in the observed wind. *Subject Headings:* **1. Theo dolite observation errors 2. Balloon ascension rates.**—*Author's abstract.*

10.5–173 551.508.7

Gerhardt, John R. (*Electrical Engineering Research Laboratory, University of Texas*) **Observations of small-scale rainfall-rate time variations with sensitive rainfall recordin instruments.** *American Meteorological Society, Bulletin*, 39(4):189–194, April **1958.** 7 figs. 3 refs. **DWB, DLC**—A research program involving the study of the attenuation and back scattering by rain of millimeter wavelength radiation has resulted in the requirement for ver accurate measurements of rainfall characteristics along paths ranging from 1000 to 2000 f A special continuous-wire raingage has been developed which gives an essentially continuou rainfall response by measuring the water level in a cylindrical gage. An accuracy of 0.001 in of rain is obtainable. The responses from two of these gages are compared with those fro a number of modified tipping bucket and other gages for several rains in the Austin area *Subject Heading:* **1. Rain gages.**—*Author's abstract.*

10.5–174 551.508.8

Goddard, N. E. and Dell, H. A. (*both, Mullard Res. Lab., Salfords, Eng.*), **A radar sond system for upper air measurements.** *Philips Technical Review*, Eindhoven, Netherlands 19(9):258–263, **1957/58.** 9 figs., 2 refs. **DWB** (M08.85 G578ra)—Short description of radar sonde system, developed by the Mullard Research Laboratories in conjunction with th Royal Radar Establishment, for measurements of wind speed, wind direction, temperature pressure and humidity up to high altitudes ($\geqslant$24 km). A telemetering thermometer, barom eter and hygrometer, together with a transmitter, receiver and encoder are carried by a free hydrogen-filled balloon. The receiver is periodically interrogated by pulses transmitted fro the ground station and the airborne transmitter responds with a signal which is used to de termine the balloon's position. Its instantaneous speed and direction of movement (i.e. the wind vector) are determined and recorded by an automatic wind computer. The sam signal also carried the temperature, pressure and humidity information coded as pulse delays these are decoded and the readings continuously recorded at the ground station. *Subje Headings:* **1. Radarsondes 2. Upper air measurement techniques.**—*Authors' abstract.*

10.5–175 551.508.

Meessen, A. (*Centre de Physique Nucléaire de l'Université de Louvain*), **Influence de l température sur l'efficience des compteurs à scintillation.** [Temperature effect on the effic ency of scintillator counters.] *Journal de Physique et le Radium*, Paris, 19(4):437–442 April **1958.** 4 figs., 27 refs. French and English summaries p. 437. **DLC**—Experimenta results are reviewed and compared with those of the author. The temperature effect of th scintillator is interpreted for NaI–Tl by lattice emission at low temperature, and by a shif of the Tl-centre emission band at 20°C and at 100°C. The variation of the photocathod sensitivity reduces to a shift of the spectral response curve towards the red for lower tem perature, at which the dynodemultiplication would be increased. This is interpreted by

rface-photoelectric effect for red light and a volume effect in secondary electron emission d blue light photoelectron emission. *Subject Heading:* **1. Scintillation counters.**—*Author's stract.*

10.5–176 551.508.93:551.510.41

Herman, L. and Séguier, J. (*Laboratoire des Recherches Physiques, Sorbonne*) and Herman, (*Observatoire de Meudon*), **Processus d'émission dans la phosphorescence de l'argon.** Emission process in the argon phosphorescence.] *Journal de Physique et le Radium*, Paris, (4):463–474, April **1958.** 14 figs., 19 refs., 14 eqs. French and English summaries p. 463. LC—The intensity change in the afterglow emission spectrum in argon has been measured ing a rotating mirror spectrograph. The intermolecular Stark effect broadening of spectral nes has been used to measure the rate of the electron decay and the radiative recombination efficients of a number of CuI lines. The results for different pressures so far obtained are scussed and compared with existing tentative interpretations of the very high values of the oss sections found for the capture of electrons by molecular ions. *Subject Headings:* **1. Argon nosphorescence 2. Rotating mirror spectrographs.**—*Authors' abstract.*

10.5–177 551.508.93

Tyler, John E. and Richardson, W. H. (*both, Univ. of Calif., La Jolla, Calif.*), **Nephelometer r the measurement of volume scattering function in situ.** *Optical Society of America, Journal*, (5):354–357, May **1958.** 5 figs. (incl. photo), foot-refs., 8 eqs. **DLC**—A submarine ne- helometer has been built for use in measuring the volume scattering function of natural aters. Theory and construction details of the optical system are given, including pertinent ata for the photodetector used. The instrument is capable of measuring volume scattering nction between angles of 20° and 170° in typical coastal waters. Results of preliminary sts with the instrument are given. *Subject Heading:* **1. Nephelometers.**—*Authors' abstract.*

10.5–178 551.508.94

Takeuti, Tosio; Isikawa, Haruzi and Takagi, Masumi, **On the mill type electric field ieter.** *Nagoya Univ. Research Institute of Atmospherics, Proceedings*, 5:64–70, March 958. 8 figs., 4 refs. **DWB**—A mill type electric field meter with high time response has een constructed to measure the electric field change due to lightning discharge. Alternating oltage proportional to the field is produced by the mill consisting of sixty inductive electrodes nd a rotary disc. The voltage is amplified and then fed into three recorders. These are a amera system to photograph the field change displayed by cathode-ray-tube, a magnetic ape recorder, and an ink writing ammeter. It has been found that the meter has two major efects which seem to be inevitable to this type of field meters. The first of them is the eduction of sensitivity when the meter is used in the natural electric field as compared with hat when it is calibrated in artificial electric field, and the second is the surplus voltage from he field mill when it is shielded from the field. *Subject Heading:* **1. Electric field meters.**— *Authors' abstract.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Proceedings of Workshop on Stratospheric Analysis and Forecasting, Wash., D. C., Feb. 1–3, 1956,** 10.5–3; **Aviation and military forecasts, N. America,** 10.5–27; **Comm. networks conf., Paris, France** (Alaka), 10.5–56; **Sea ice formation forecasting, Helgoland, W. Baltic** (Goedecke), 10.5–134; **Long range ice forecasting, American Arctic,** 10.5–135, –136; **Fishing industry, Caspian Sea** (Andreev), 10.5–144; **Balance equation and numerical typhoon forecasting** (Masuda), 10.5–235; **Mean pressure charts** (Okamoto), 10.5–266.

10.5–179 551.509.31:551.577.37:551.509.5

Cherkasskaia, V. M., **Livnevye dozhdi v grebne vysokogo davleniia 12–13/VIII 1954 g.** [Downpours in a high-pressure ridge, Aug. 12–13, 1954.] *Moscow. Tsentral'nyi Institut Prognozov, Trudy*, No. 52:57–66, **1957.** 8 figs., ref. **DLC**—The occurrence of shower rainfall nd thunderstorms over Moscow was contrary to the forecast. The portion of the front

behind Moscow and wave disturbances were difficult to forecast. The synoptic situatio at the time the forecast was made and the appearance of the conditions leading to the formatio of cumulonimbus clouds in the ridge of high pressure and brief rainfall are analyzed with th aid of synoptic maps and aerological diagrams. The advection of cold air aloft was the prin cipal factor favoring the development of cumulonimbus clouds on the western periphery of th ridge. The decisive element in the development of these rain clouds was adiabatic fall o temperature at the 500 mb level, which occurred during the evening and with which the thunder storm was associated. The duration of convection was the fundamental element determinin the large rainfall amount. *Subject Headings:* **1. Excessive rainfall 2. Forecast errors 3. Syn optic analysis 4. Cold air advection aloft 5. Moscow.**—*I.L.D.*

10.5–180 551.509.31:551.509.5:551.515.

Gorodova, M. I., **Groza 4/VII 1954 g.** [Thunderstorm of July 4, 1954.] *Moscow Tsentral'nyĭ Institut Prognozov, Trudy*, No. 52:47–56, **1957.** 7 figs., 2 tables, 3 refs. **DLC**— The thunderstorm of July 4, 1954 which occurred over Moscow was not predicted in th forecast. The forecast map, which was verified fairly satisfactorily, indicated that the Moscow District was situated on the southwestern periphery of an extensive quasi-stationary anti cyclone occupying most of European Russia and Western Siberia. In the lower troposphere southeasterly and southerly transport was established over Central Europe. The resultin precipitation was intramass precipitation. The following day, July 5, a similar synopti situation, however, was not accompanied by rainfall. By means of detailed analysis of th synoptic data, with the aid of synoptic charts and aerological diagrams, the author shows tha the thunderstorms on July 4 were the result of advection of sufficiently saturated air an vertical motion which led to complete saturation, and, in the presence of a gradient exceedin the moist adiabatic, produced conditions favoring convection from upper levels, the presenc of dynamic turbulence and radiation from the upper cloud boundaries. By determining th amount of energy of instability by the usual method (i.e., according to the area between th curve of stratification and the curve of state constructed from the maximum dew point value it was found that the area of positive energy of instability on July 5 was several times greate than the area on July 4. Accordingly, the size of the energy of instability is not a criterio of the positive development of thunderstorms or shower rainfall. *Subject Headings* **1. Thunderstorms 2. Forecast errors 3. Forecast verification 4. Advection 5. Synopti analysis 6. Moscow.**—*I.L.D.*

10.5–181 551.509.31:551.509.

Isaeva, E. N., **Kharakter oshibok v prognozakh pogody letom 1954 g.** [Characteristic of errors in forecasting weather in the summer of 1954.] *Moscow. Tsentral'nyĭ Institu Prognozov, Trudy*, No. 52:3–8, **1957.** 3 tables. **DLC**—During the summer period May Aug. 1954, the short range weather forecasts for Moscow and its environs showed a verificatio of 73.5% as compared with an annual verification of 79%. Of 246 forecasts (18, 24 and als 36 hour) during this period, 77 (31%) failed to be verified; of this 25 were not verified at nigh and 52 during the day. Ninety-eight % of the unsuccessful forecasts included precipitatio and temperature and only 2% cloudiness. Temperature forecasts failed in 12%, precipitatio in 82% and temperature and precipitation in 4% of the cases. Forecast failures are of tw types, namely: (1) errors associated with uneven areal distribution of rainfall or errors i intensity of rainfall and (2) fundamental failures involving forecasting rainfall within an ai mass, weather without rainfall, etc. The reasons for such failures include errors in forecast of pressure field and frontal positions, errors in forecasting stratification of the atmosphere etc. Specific examples of the relationship of forecast failures to errors in forecasts of pressur field, to inexact frontal analysis on the initial weather map etc, are presented. *Subject Head ings:* **1. Short range forecasting 2. Forecast errors 3. Forecast verification 4. Moscow** —*I.L.D.*

10.5–182 551.509.324.2:551.509.5:551.57

Isaeva, E. N., **Razbor neudachnogo prognoza pogody na den' 28/VII 1954 g.** [Analysi of an unsuccessful weather forecast for July 28, 1954.] *Moscow. Tsentral'nyĭ Institu*

prognozov, Trudy, No. 52:31–34, **1957.** 2 figs., table. **DLC**—The forecast of rain for July 28, 1954 for Moscow and Moscow District failed to materialize. The failure resulted from an error in the prediction of the motion and evaluation of the low, center of which lay over Kaunas in the morning of July 27 with a pressure of 995 mb at the earth's surface. While the low moved as forecast, east-south-east, its velocity was around 50 km/h at the 3 km level; the predicted velocity being 30 km/h. Also the pressure in the cyclone rose at the earth's surface by 5 mb and by 6 mb at 700 km. The error in the position of the low amounted to 600 km. In order to forecast the weather, it was important to foresee the evolution of the rainfall zone in its region since simultaneously with the filling of the low, the rainfall zone in its region began to undergo degradation. The cause of the latter was determined by computing the vertical motion and amount of rainfall for several points near the center of the cyclone on the nights of July 27 and 28. The vertical motions and the computed and actual rainfall amounts are compared. And the agreement of the rainfall amounts is so close that a good forecast of the pressure field at the surface and aloft (surface level of 700 mb) can provide a good forecast of the evolution of the rainfall zone. *Subject Headings:* **1. Forecast errors 2. Rainfall forecasting 3. Pressure fields 4. Moscow.**—*I.L.D.*

10.5–183 551.509.31:551.515.8

Koo, Chen-chao; Chen, Yung-san and Shu, Yu-fung (*all, Inst. of Geophysics and Met., Academia Sinica*), **Frontal θse chart and its application to the analysis of upper boundary of cold-wave front in China.** *Acta Meteorologica Sinica*, Peking, 29(1):44–56, Feb. **1958.** 17 figs., 16 refs. In Chinese; English summary p. 56. **DWB**—A newly designed chart—frontal θse chart is presented as a tool for frontal analysis. This tool is applied to the analysis of the upper boundary of cold-wave fronts in China for two cases. It is found that the θse over the upper frontal boundary is far from uniform and the θse value of maximum changes rather considerably with time. By means of this the authors try to demonstrate that the frontal surface is not a simple material surface always consisting of the same set of air particles, but rather a structure with its own mechanism of metabolism, subjecting continuously frontogenetic process. The significance of this findings for frontal analysis and numerical forecasting is also discussed. *Subject Heading:* **1. Frontal analysis.**—*Authors' abstract.*

10.5–184 551.509.31:551.524.36

Koppány, György, **Az 1957-es nyár rendkívüli melegperiódusának makroszinoptikus vizsgálata.** [Analysis of the large-scale synoptic situation during the unusual warm period of the summer of 1957.] *Időjárás*, Budapest, 61(4):284–289, July/Aug. **1957.** 5 figs., table. German summary p. 284. **DLC**—At the end of June 1957 an unusual heat wave set in over a large part of Europe and lasted almost two weeks. The developments leading to this situation are analyzed on the basis of synoptic and aerological data. It is found that the unusual heat wave may be attributed to the combined effect of two factors. 1) a strong dynamic increase of pressure and temperature and 2) advection of subtropical air by south-westerly upper air currents. *Subject Headings:* **1. Synoptic analysis 2. Heat waves 3. Europe.**—*Trans. of author's abstract, G.T.*

10.5–185 551.509.31:551.515.1/7(269)

§Langford, J. C. (*Div. Office, Hobart*), **Southern ocean analysis with special reference to the period December 1954–March 1955.** *Australian Meteorological Magazine*, Melbourne, No. 16:1–22, March **1957.** 10 figs., 9 refs. **DWB**—Day-to-day analysis of the surface synoptic conditions in the Southern Ocean shows the fairly uniform longitudinal distribution of cyclones, that 45°S has the highest frequency of cyclogenesis and a source of polar anti-cyclogenesis south of the Atlantic Ocean. Also, the uniform sea surface does not engender an unbroken circulation pattern as would be supposed when reports are sparse. Charts show frequency distribution of cyclonic and anticyclonic centers and genesis by 5° squares from Antarctic continent to 30°S and storm tracks. Also, an analyzed series for Jan. 6–11, 1953 is presented and discussed. *Subject Headings:* **1. Southern Ocean analysis 2. Cyclone distribution.**—*From author's abstract and M.R.*

10.5–186 551.509.31:551.511.15:551.577

Mertsslov, A. N., **Dva sluchaia konvektivnykh osadkov.** [Two cases of convective precipitation.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy*, No. 52:15–30, **1957.** 12 figs., 3 refs. **DLC**—Two cases of convective rain, which occurred when forecasts of no rain were made, are analyzed synoptically. In the first case (July 29, 1954) the rain was caused primarily by the convective instability of the atmosphere in the region of the front; the regular vertical air motion resulting from instability and ground friction was small and its role was not important. The latter, calculated by maps of absolute topography and surface weather maps for hours, indicated weak ascending air motion of the order of 15–20 mb at the 850 mb and 750 mb surfaces and of the order of 50–90 mb at the 500 mb level. The regular vertical motion was a factor in influencing the stratification and moisture aloft which favored convective rainfall. An analysis of the days immediately preceding the forecast day with the aid of aerological diagrams and synoptic charts indicates that rainfall should have been expected. The second case (July 30, 1954) involves the occurrence of convective rainfall with large regular vertical air motion associated with marked cyclonic deepening. The synoptic analysis is made with the aid of aerological diagrams, thermobaric charts, etc. *Subject Headings:* **1. Convective rainfall 2. Synoptic analysis 3. Forecast errors.**—*I.L.D.*

10.5–187 551.509.323:551.509.325

Pollard, K., **A preliminary study of night cooling under clear skies at Wittering.** *Meteorological Magazine*, 87(1027):12–16, Jan. **1958.** 2 figs., 2 tables, 2 refs. **DWB, DLC**—An attempt is made to forecast the time at which critical screen temperatures for the formation of radiation fog and turbulent stratus will occur. The method developed involves the construction of "typical" cooling curves for radiation nights (cloudless or near cloudless evenings and nights) for each season of the year, for easterly and westerly surface winds and for wind of Beaufort force 0–2 and 3–4. For conditions peculiar to each of these curves a constant for use in the formula suggested by McKenzie (a method of estimating night minimum temperatures, unpublished, Met. Off. Library, London, 1943) for night minimum temperatures was used. The applications of this procedure to forecasting is illustrated. The constants for use in McKenzie's formula, the formula itself, "typical" cooling curves and comparison of forecast with actual temperatures are presented. *Subject Headings:* **1. Radiation fog forecasting 2. Nocturnal minimum temperature forecasting 3. Wittering, Eng.**—*I.L.D.*

10.5–188 551.509.312:551.524.35:681.14:621.38

Musaelian, Sh. A. and Kheĭfets, Ia. M., **Opyt primeneniia elektronnoĭ vychislitel'noĭ mashiny "Pogoda" dlia prognoza srednemesiachnoĭ anomalii temperatury vozdukha.** [Experiment on the application of the electronic computer "Weather" for predicting the monthly mean temperature anomaly.] *Meteorologiia i Gidrologiia*, Leningrad, No. 2:3–9, **1958.** 3 figs., 4 refs., 16 eqs. **DLC.** Trans. by V. Zilius issued by American Meteorological Society under Contract AF 19(604)-1936, July **1958.** (12 p.) **DWB**—The method for forecasting numerically mean monthly temperature anomalies by means of the electronic computer "Pogoda" (Weather) is presented. This machine is capable of computing summations of the form $\Sigma_n \Sigma_m p_n{}^m q_n{}^m$. The theory of this method is based upon the work of E. N. Blinova who, viewing atmospheric motion as a disturbance imposed upon a zonal plane, linearized the equation of heat advection and obtained a new equation for non-zonal and non-stationary temperature disturbances. This equation describes the relationship between local temperature disturbances and significant elements of the atmospheric circulation, such as zonal temperature transport, etc. The general scheme of calculation with the machine is outlined, and the equations involved in the steps of preparing the initial data, computation of the Fourier coefficients, computation of coefficients for analyzing the initial field into a series of $H_n{}^m$ functions, computation of Fourier coefficients of the forecast field and the computation of the mean monthly temperature anomalies are presented. The performance of the computation by the machine is described on charts showing forecasts of mean monthly temperature anomalies, and actual mean monthly temperatures for June 1957 are presented. The forecast was made from initial data for April 19–21, 1957 and required 56 working hrs. *Subject Headings:* **1. Numerical temperature forecasting 2. Forecasting temperature anomalies 3. Electronic computers.**—*I.L.D.*

10.5–189 551.509

Sartor, J. Doyne (*Rand Corporation*), **A systematic approach to local objective forecast studies.** *American Meteorological Society, Bulletin*, 39(1):21–27, Jan. **1958.** 5 figs., 4 refs. **DWB, DLC**—Problems in the design, preparation, and use of local objective forecasting studies have been evaluated while specific local objective forecasting studies were being made. As a result, a systematic procedure that may be used as a guide in designing and preparing local objective forecasting studies was developed and tested in a number of seminar-workshop groups. The systematic procedure is outlined and discussed with illustrations from several local objective forecasting studies. The procedure consists of defining the local forecasting problem in terms consistent with observing and forecasting capabilities, resolving the variability of the forecast element into its cyclic (seasonal and diurnal) and "synoptic" components and, finally, reassembling the components into a forecast scheme that allows the forecaster to exercise his training as a meteorologist. Objective studies for forecasting visibility at Rhein-Main, Germany, were developed and tested against data for 4 other stations in Germany and England, and against other meteorological variables (surface winds, thunderstorms, and cross-wind components). The studies were made with an eye toward evaluation of the technique which is called SAPLOFS or "Systematic approach to local objective of forecast studies" and is analogous to procedures used in chemical analysis. *Subject Headings:* **1. Local objective forecasting 2. SAPLOFS.**—*Author's abstract and M.R.*

10.5–190 551.509.54:551.509.313

Chang, Yen (*Central Weather Bureau, China*), **A test of graphical method for quantitative precipitation forecasting.** *Acta Meteorologica Sinica*, Peking, 29(1):7–15, Feb. **1958.** 7 figs., 2 tables, 7 refs., 16 eqs. In Chinese; English summary p. 15. **DWB**—A test of graphical method for quantitative forecast of precipitation is presented. First the saturation water vapor content below 500 mb is calculated from the forecasting value of 1000–500 mb thickness by two-layer model. Then the water vapor content is again predicted from the assumption of $dq/dt = 0$. The difference between the two predicated values of water vapor content gives the forecasted precipitation (if the difference is positive). *Subject Headings:* **1. Precipitation forecasting 2. Graphical prediction models.**—*Author's abstract.*

10.5–191 551.509.52

Reiter, Elmar R. (*Univ. of Chicago*), **The layer of maximum wind.** *Journal of Meteorology*, 15(1):27–43, Feb. **1958.** 39 figs., 22 refs., 4 eqs. **DWB, DLC.** Also issued as: Chicago Univ. Dept. of Meteorology, Contract Noas-55-262-C, Final Report, Jan. **1957.** 45 p. 67 figs., 2 tables, 19 refs., 8 eqs.—The three-dimensional wind field in the vicinity of the jet stream is defined with the aid of four parameters: mean wind speed and direction, thickness, and mean altitude of the Layer of Maximum Wind (LMW). Routine methods of analysis of these quantities are discussed in view of the reliability of available wind data, and a statistical treatment of these quantities reveals the mean horizontal and vertical structure of the LMW. Forecasts of the LMW are attempted by means of a grid or "box" method, and a control-line method. *Subject Headings:* **1. Maximum wind forecasting 2. Layer of maximum wind.**—*Author's abstract.*

WEATHER CONTROL

10.5–192 551.509.616

Droessler, Earl G., **Federal government activities in weather modification and related cloud physics.** (In: U. S. Advisory Committee on Weather Control, **Final Report,** pub. **1957.** 2:253–256.) **DWB, DLC**—The author describes the role of the individual departments of the U. S. Government in studies on weather modification and cloud physics since the joint Cirrus Project. The Dept. of Defense organized an Advisory Group on Artificial Cloud Nucleation which surveyed the literature on cloud physics and weather modification and established the following projects: extratropical cyclones, migratory cloud systems, convective clouds, cold stratus and fog, ice fogs and warm stratus. The Dept. of the Army carried out (1) studies on the comparative efficiency of dry ice and AgI seeding, (2) seeding experiments in West Germany, Greenland and Ellesmere Island and developed equipment for

nuclei generation. Except for the attempt to seed freezing rain from the ground, the Navy Dept. devoted its attention to problems of cloud physics, contrails, availability of water for precipitation over the U. S., etc. The Dept. of the Air Force chiefly under contract with the U. S. Air Force Geophysics Research Directorate conducted research on the structure of cumulus clouds, various field studies on smog, fog and related atmospheric contamination and visibility problems, "poisoning" of natural nuclei, etc. The U. S. Weather Bureau engaged in field tests in cooperation with the Dept. of Defense, carried out research on the mechanics of cloud formation and precipitation growth, cloud seeding operations in Southwestern Washington, etc. The National Science Foundation has supported various projects on cloud physics and cloud seeding at universities, which are listed. Also the U. S. Forest Service has engaged in several weather modification projects. *Subject Headings:* **1. Weather modification 2. Cloud physics 3. Cloud seeding 4. United States.**—*I.L.D.*

10.5–193 551.574.1:551.509.617

†MacCready, P. B., Jr.; Smith, T. B.; Todd, C. J. and Beesmer, K. M., **Nuclei, cumulus, and seedability studies: Project Seabreeze, Pasadena cooperative program of ice nuclei measuring techniques, Mt. Withington Project, Santa Barbara radar evaluation and other studies.** (In: U. S. Advisory Committee on Weather Control, **Final Report,** pub. **1957.** 2:137–200, 54 figs., 3 tables, 54 refs.) **DWB, DLC**—A comprehensive and detailed report on the physical evaluation of the validity of cloud seeding effects in the formation of rain, snow, hail and lightning in the experiments carried out by Meteorology Research, Inc. under the sponsorship of the Advisory Committee on Weather Control. Part I contains a historical account of the various projects from their beginning in the summer of 1955 to their termination in the summer of 1957. A description of the organization, conduct and equipment of a typical field experiment. With the aid of photographs the authors describe the various types of equipment used, namely: time-lapse cameras; projectors, portable cold box, aircraft, radar, silver iodide generators, ion collector, cloud droplet samples; Part II, Cumulus Studies is concerned with the execution and evaluation of the experiments in which clouds were seeded with silver iodide ground generators in order to introduce freezing nuclei into convective clouds and obtain precipitation; Part III, Nucleation and natural Nuclei Studies, deals with studies on the dimensions, concentration and distribution of natural freezing nuclei with the aid of the Australian expansion box, the application of laboratory observations on natural nuclei to conditions within clouds, the reactivation of nuclei and the role of industrial nuclei as freezing nuclei; Part IV, Report on the Pasadena Cooperative Program of Ice Nuclei Measuring Techniques, deals with freezing nuclei concentration measurements using the Australian expansion box, MRI dual temperature box, Australian Bigg box, Signal Corps Box and deep freeze box. The various types of apparatus are described with the aid of photographs and the discussion covers the following: the results of comparative measurements of natural nuclei concentrations, effect of moisture on nuclei counts, silver iodide and dust measurements with these boxes, effect of fragmentation or generation of ice crystals at the interior walls of the boxes, etc; Part V, Silver Iodide Study, includes studies of plumes from silver iodide ground generators and their tracing and decay, the nature of a plume model, and the use of the portable cold box for simulating temperature and moisture conditions inside a "typical cloud" at the precipitation producing stage; Part VI is concerned with the procedures and results of the Santa Barbara radar evaluation study, the cloud electrification studies at Boca Raton, Missoula (Montana) and the value of electrification as a research tool; the results of traverse seeding with light aircraft at Missoula; and the results of small scale seeding low supercooled stratus with silver iodide and dry ice at Missoula. *Subject Headings:* **1. Cloud seeding evaluation 2. Cloud seeding effects 3. Cloud seeding projects 4. Freezing nuclei 5. Cloud seeding with silver iodide 6. Santa Barbara, Calif. 7. Pasadena, Calif. 8. Missoula, Mont.**—*I.L.D.*

10.5–194 551.509.617(691)

Madagascar. Service, Météorologique, **Les opérations de pluie provoquée à Madagascar en 1957.** [Artificial rain produced at Madagascar during 1957.] Its *Bulletin de Madagascar,* No. 141:107–110, Feb. **1958.** 2 figs.—In the authors' opinion, significant results were re-

peatedly obtained during the months Jan., Feb. and April in different regions of Madagascar. On the other hand, the trials made during the cool season were less conclusive. A new analysis method has been elaborated and is based on the comparison of the pluviometry in the treated zone and in a zone double in area encircling the first mentioned zone. For the authors, the efficacy of seedings seems to be confirmed. *Subject Headings:* **1. Cloud seeding in Madagascar 2. Madagascar.**—*A.V.*

10.5–195 551.509.617 628.1

Mendes Correa, A. A. (*Univ. do Porto, Portugal*), **A aqua, nos seus ciclos, ao servico do homen.** [Water and its cycles in the service of man.] *Sociedade de Geografia, Lisbon, Boletim,* Ser. 75, No. 1/3:43–52, Jan./March **1957.** ref. English summary p. 52. **DLC**—A paper by Gilbert Ducellier (**Vers . . . l'amenagement des fleuves aeriens en Afrique du Nord**) on successful cloud seeding (AgI from aircraft) in Algeria is reviewed and possible applications to Cape Verde Islands are discussed as well as the decisive influence of water upon human population and economy. *Subject Headings:* **1. Cloud seeding with silver iodide 2. Water resources 3. Algeria.**—*G.T.*

10.5–196 551.509.617

Meteorology Research, Inc., Pasadena, Calif., **Report on the Pasadena Cooperative Program of ice nuclei measuring techniques, to the Advisory Committee on Weather Control.** May 27, **1957.** 20 p. 8 figs., 11 refs. **DWB** (M09.67 M589 r)—Several types of ice nuclei formation boxes are described and illustrated and results of tests performed in them compared graphically. The Australian Expansion Box, The Australian Bigg Box, the Signal Corps Box, the WRDC Deep Freeze Box, the MRI Dual Temperature Box, the MRI Portable Cold Box are the 6 types compared in the controlled experiment. The natural nuclei of the Pasadena area were used first and then AgI and dust from Albuquerque were introduced. Variability between boxes was not as great as that in published literature. The Australian expansion chamber gave the lowest count. *Subject Headings:* **1. Nuclei formation boxes 2. Expansion chambers.**—*M.R.*

10.5–197 551.509.617:551.521.17

Sano, I. and Fukuta, N. (*both, Chem. Inst., Nagoya Univ.*), **Effects of water vapour, ammonia and hydrogen sulfide against the decay of silver iodide smoke under irradiation of ultraviolet light.** *Meteorological Society of Japan, Journal,* Ser. 2, 34(1):34–40, March **1956.** 10 figs., 3 tables, 10 refs., 4 eqs. In Japanese; English summary p. 34–35. **DWB, DLC**—Smoke chamber experiments aimed at studying the decay rate of ice-forming properties of silver iodide particles under ultraviolet irradiation are reported. Water vapor, ammonia and hydrogen sulfide were all found to be effective in preserving nucleating properties of AgI against decay due to ultraviolet radiation. The possible mechanisms of this protective action were also investigated and are discussed. *Subject Headings:* **1. Silver iodide decay 2. Ultraviolet light effects on nuclei.**—*G.T.*

10.5–198 551.509.617:551.510.42:551.574.1

Serpolay, R. (*C.N.R.S., Obs., du Puy de Dôme*), **Propriétés glaçogènes des aérosols produits par la volatilisation des métaux.** [Icing properties of aerosols produced by volatilization of metals.] *Puy de Dôme. Observatoire, Bulletin,* Ser. 2, No. 3:86–87, July/Sept. **1956.** 2 refs. **DWB**—Note on the volatilization of metallic filaments (Ag, Al, Cr, Du, Fe, Mo, Ni, Pb, Sn) and the nucleating properties of these volatile particles when they are introduced into supercooled clouds. They all seem to produce freezing at temps. above the spontaneous freezing temp. of clouds—at −16°C large numbers of ice crystals form in presence of these particles and at −7°C or −10°C when Ag or Al is present. Meteoritic dust may contain such volatile iron products as would produce freezing at higher temps. than normal. *Subject Headings:* **1. Nucleation by volatile metallic particles 2. Meteoric dust nucleation.**—*M.R.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

DENSITY AND COMPOSITION OF THE ATMOSPHERE

See also: **Argon phosphorescence** (Herman, Seguier), 10.5–176; **special bibliog. on Ozone,** p. 759.

10.5–199 551.510.3:551.510.535:551.524.

Nicolet, Marcel, **High atmosphere densities.** *Science*, Wash., D. C., 1 (3310):1317–1320, June **1958.** Also issued as: *Belgium. Institut Royal Météorologique, Contributions* No. 41, **1958.** 5 figs., 18 refs. **DLC**—This article shows how the concept of the thermosphere must be considered, according to the view of CHAPMAN on the extension of the corona toward the earth's atmosphere and according to the atmospheric structure determined by the author who introduced diffusion distributions for all constituents at altitudes above 110 km. The atmospheric models of the thermosphere that neglect diffusion cannot explain ionospheric and satellite observations. The dissociation of molecular nitrogen cannot be introduced to decrease the mean molecular mass. The oxygen-nitrogen ratio cannot be considered as constant. An atmospheric model must be founded on heat transport such as suggested by CHAPMAN. It is possible to estimate temperatures and temperature gradients in the neighborhood of 500 km and, consequently, conservative values of densities, if various values of the heat conduction are adopted. *Subject Headings:* **1. High atmosphere densities 2. Thermosphere 3. Satellite observations 4. Temperature in the upper atmosphere.**—*A. V.*

10.5–200 551.510.41:551.510.721:551.577.

Blifford, Irving H., Jr. (*Hqs., AF Cambridge Res. Center, Bedford, Mass.*), **The scavenging of particulate matter from the atmosphere.** *International Geophysical Year*, 1957/1958 *Annals*, 5 (IGY Instruction Manual), Pt. 5:336–339, **1958.** fig., 2 tables, 9 refs. **DWB**—Atmospheric particles can be removed from the air by gravitational settling, by electrical action and by mechanical effects such as washing by precipitation. Gravitation is most effective for particles larger than one micron. For small particles rainfall scavenging is the most effective agent, even down to a size of 0.001μ. The concentration of particulate matter in the air is also reduced by attachment of wind-carried particles on objects of small physical dimensions. Material of a fibrous structure is an efficient collector of radioactive particles. *Subject Headings:* **1. Air sampling and analysis 2. Radioactive fallout 3. Radioactive rainfall.**—*Author's abstract.*

10.5–201 551.510.41:551.501:546.26

Callendar, G. S. (*A.R.D.E. Ministry of Supply, London*), **On the amount of carbon dioxide in the atmosphere.** *Tellus*, Stockholm, 10(2):243–248, May **1958.** fig., 2 tables, 11 refs. **DWB, DLC**—Of late years there has been much interest in the effect of human activities on the natural circulation of carbon. This demands a knowledge of the amount of CO_2 in atmosphere both now and in the immediate past. Here the average amount obtained by 3 of the most extensive series of observations between 1866 and 1956 is presented, and the reliability of the 19th century measurements discussed. A base value of 290 p.p.m. is proposed for the year 1900. Since then the observations show a rising trend which is similar in amount to the addition from fuel combustion. This result is not in accordance with recent radiocarbon data, but the reasons for the discrepancy are obscure, and it is concluded that much further observational data is required to clarify this problem. Some old values, showing remarkable fall of CO_2 in high southern latitudes, are assembled for comparison with the anticipated new measurements, to be taken in this zone during the Geophysical Year. *Subject Headings:* **1. Carbon dioxide in the atmosphere 2. Carbon dioxide measurement.**—*Author abstract.*

ATMOSPHERIC POLLUTION

See also: **Dust texts and bibliogs.** (Fett), 10.5–11; **Meteoric dust nucleation** (Serpolay), 10.5–198.

10.5–202 551.510.42:551.508.9

Mrose, Helmut, **Ein chemisches Verfahren zur Russbestimmung in atmosphärischer Luft.** [Chemical method for the determination of soot in atmospheric air.] *Zeitschrift fü*

Meteorologie, Berlin, 11(5/6):139–142, May/June **1957.** 6 refs., table. **DWB, DLC**—The particle number measured in a conimeter or in a nuclei counter is not an adequate measure of atmospheric pollution. A more suitable measure of the amount of atmospheric impurities is the determination of the total amount of air reducing trace substances (organic vapors, soot, SO_2 and other anthropogenic impurities). The investigation of slightly polluted air can be carried out by sucking in through glass-wool filter which retains all solid and drop like reducing substances and determining the amount of consumption was above the average. In the case of inversions, the bichromate consumption was 6.6 mg/m³ as compared with 0.36 mg/m³ after dissolution of the inversion. A possible relationship between the high degree of pollution and frequency of angina is hazarded by the author. *Subject Headings:* **1. Atmospheric pollution measurement techniques 2. Soot falls 3. Chemical analysis of nuclei.**—*Author's abstract and I.L.D.*

10.5–203 551.510.42

Renzetti, Nicholas A.; Rogers, Lewis H.; Neiburger, Morris et al., **Aerometric survey.** *Air Pollution Foundation, Los Angeles, Calif., First Technical Progress Report*, 1954, pub. March **1955.** p. 39–67. 20 figs., 3 tables, 12 refs.—An aerometric study of the Los Angeles atmosphere to determine: 1) possible dissipation of smog and smog producing substances, 2) relationship between oxident value and manifestations of smog, namely—eye irritation, plant damage and reduced visibility and 3) distribution of smog in severity and time throughout the Basin was carried out during Aug.–Nov. 1954, together with supporting meteorological observations of inversion height, radiation, wind velocity, temperature and relative humidity made at 10 sampling stations equipped with various kinds (not every kind at each of the stations) of oxidant recorders and by studies of the contaminants at various altitudes above several stations by blimps. The data are still being processed by some preliminary results in the form of graphs and curves and tables showing the effect on plant damage and eye irritation are presented and discussed. *Subject Headings:* **1. Atmospheric pollution control 2. Smog 3. Atmospheric pollution effects 4. Los Angeles, Calif.**—*A.M.P.*

10.5–204 551.510.42:551.508.91

*U. S. National Bureau of Standards, **Report of work on air pollution at the Bureau, Jan. 1–July 1, 1956.** 29 p. 4 figs. Also **Report, July 1–Oct. 1956, Pt. 1, Study of Reactions of atmospheric pollutants, and Pt. 2, Method of interpreting mass spectra of pollutants by the use of average patterns of traffic gases.** 46 p. 6 figs., 5+8 tables. Also: **Quarterly Report, Oct. 1, 1956–Jan. 1, 1957.** 11 p. Photostats of typescript. Looseleaf. **DWB** (M10.42 J586r, 1956)—A summary with data and diagrams of the progress made on a number of investigations being undertaken by the National Bureau of Standards on the sampling of atmosphere pollutants from a number of cities in the U. S. (especially Louisville, Ky.), the development of better analysis techniques or equipment, a graphic method of estimating amount of pollutant in traffic (gas chromatograph), etc. *Subject Headings:* **1. Atmospheric pollution measurement 2. Air sampling and analysis 3. Automobile exhaust pollution 4. Louisville, Ky.**—*M.R.*

UPPER ATMOSPHERE—IONOSPHERE

See also: **Trop. propagation texts** (Boudouris), 10.5–28; **Elementary met. books** (Liapunov), 10.5–33; **Stratospheric temps., Antarctica** (Bannon), 10.5–63; **Thermosphere and satellite obs.** (Nicolet), 10.5–199; **Lyman alpha radiation in ionosphere** (Warwick, Zirin), 10.5–332; **Special bibliog. on ozone,** p. 759.

10.5–205 551.510.53:551.524.7

Kalitin, N. N., **Vertikal'nye peremeshcheniia vozdukha v stratosfere kak sledstvie nagrevaniia kosmicheskoĭ pyli solnechnoĭ radiatsieĭ.** [Vertical movements of air in the stratosphere due to heating of cosmic dust by solar radiation.] *Priroda*, 11:53–54, **1947.** Trans. into English by E. R. Hope issued as *Canada. Defence Research Board, Translation* T-199-R, Aug. **1956.** 2 p. **DWB** (M10.53 K14v)—A brief review is given of Russian contributions as a background for L. R. RAKIPOVA's theory. The heat transfer between the dust particles and the air is possible by way of molecular thermal conductivity. RAKIPOVA's theory is of great interest to the study of processes of the upper strata of the atmosphere,

author suggests, but further elaboration is necessary. *Subject Headings:* **1. Stratospheri vertical mixing 2. Heat absorption by stratospheric dust 3. Dust in stratosphere.**—*W.N.*

10.5–206 541.14:551.510.5

Zelikoff, Murray and Aschenbrand, Leonard M. (*both, G.R.D., A. F. Camb. Res. Cen Mass.*), **Photochemistry of nitrous oxide in the far ultraviolet.** (In: **The Threshold of space** ed. by M. Zelikoff. N. Y., Pergamon Press, **1957.** p. 99–100. 3 refs., eqs.) **DLC**—On photolysis of N_2O was investigated at the wave lengths 1849 Å, 1470 Å and 1236 Å, correspond ing to 6, 8 and 9.2 eV, where three distinct regions of continuous absorption were found previ ously. The potential energy diagram had been explained by absorption from the ground stat to three upper repulsive states. Possible mechanisms to account for the observed phenomen are discussed. *Subject Headings:* **1. Photolysis 2. Photochemistry 3. Upper atmosphere 4. Nitrous oxide.**—*A.A.*

10.5–207 551.510.535:551.594.13:523.7

Mariani, F., **Sulle correlazioni fra densità elettronica ionosferica e attività solare.** [Cor relation of ionospheric electronic density and solar activity.] *Annali di Geofisica*, Rome 10(1/2):71–87, **1957.** 9 figs., 4 tables, 5 refs. Italian and English summaries p. 87. **DLC**— A comparative study of the behaviors of the median monthly values of the maximum electro densities N in the F2-layer, for about 20 observatories located between the geographical lat 52°N and 43°S, during the years 1949–1954, leads to the following principal results: At noo (1) The dependence's law of the secular behaviors of N upon the secular behaviors of Wolf' number R, indicated $\bar{N}$ and $\bar{R}$, usually considered linear $\bar{N}=N_0(1+a\bar{R})$ appears advantage ously substituted by the law $\bar{N}=\bar{N}'_0(1+\beta\bar{R}+\gamma\bar{A})$, where A is another index of the sola activity which could be the area A_F of the hydrogen filaments. (2) The values of a are re markably greater in the Northern Hemisphere than in the Southern Hemisphere, especiall for increasing northern latitudes. The values β, instead, are about equal in the two hemi spheres, while the asymmetry of a appears, with similar features, in the values γ. (3) On obtains about similar results in the correlation of the monthly values of N—N_{12}—$\bar{N}$ wit R—$\bar{R}$ and A_F—$\bar{A}_F$. At midnight, instead, the correlations do not exhibit asymmetrie between the two hemispheres; the dependence upon A_F remains. With regard to the F1 an E layers, their characteristics appear substantially symmetric in the two hemispheres. W discuss the eventual causes of asymmetries between the Northern and Southern Hemisphere and put forward the hypothesis that the asymmetric noon characteristics of the F2 laye could be connected with the phenomena of general circulation in the high atmosphere. *Subje Headings:* **1. Ionospheric electron density 2. Solar-ionospheric relations 3. Diurnal iono spheric variations.**—*Author's abstract.*

10.5–208 551.510.535:551.590.2

†Munro, G. H. and Heisler, L. H. (*both, Elec. Eng. Dept., Univ. of Sydney*), **Ionospheri records of solar eclipses.** *Journal of Atmospheric and Terrestrial Physics*, London, 12(1):57–67 **1958.** 6 figs., 22 refs. **DLC**—Interpretations of radio observations of solar eclipses ar reviewed on the basis of experience gained in the study of travelling ionospheric disturbances It is shown that the passage of an eclipse introduces horizontal gradients of ionization whic distort the ionospheric reflecting surfaces. This implies that ionosonde soundings are n longer truly vertical and their interpretation as such must introduce errors in deduced io distributions. In addition, the varying obliquity of the returned rays will distort the apparen variation of ion density with time, and focussing may cause inaccuracies in deduced reflectio coefficients. It is emphasized that during eclipses incidental travelling disturbances will caus additional complications, which further confuse interpretation, and it is shown how they ma be detected on ionosonde records. Confirmation of the presence of curvature is provide by actual records of the 1940 eclipse taken in South Africa by A. J. Higgs. It is found difficu to estimate the actual errors in past observations, and supplementary observations durin future eclipses are suggested to facilitate such corrections and make more precise deductio possible. *Subject Headings:* **1. Eclipse effects on ionosphere 2. Ionospheric ionizatio 3. Solar eclipses.**—*Authors' abstract.*

10.5–209 551.510.535

Munro, G. H. (*Elec. Eng. Dept., Sydney Univ.*), **Travelling ionospheric disturbances in the region.** *Australian Journal of Physics*, Melbourne, 11(1):91–112, March **1958.** 21 figs., refs. **DLC**—Observations of the horizontal movements of travelling ionospheric disturbances corded on a single radio frequency from April 1948 to March 1957 are analyzed for seasonal id diurnal variations of occurrence and of direction and speed of travel. Recording was ainly in daylight hours but some limited night results are included. The average number disturbances recorded was six per day over the period. Observing accuracy and significance the deduced data are discussed. The frequency of occurrence has a diurnal variation with marked midday maximum and a seasonal variation with minima at the equinoxes. The onthly means of direction of travel show a consistent seasonal change from 30° in winter to 0° in summer with a small corresponding change in mean speed from 8 km/min in winter 7 km/min in summer. The monthly mean diurnal variation of directions was consistent om 1950 to 1954 but has shown a marked change in the last two summers. Winter directions day are mainly in the north-east quadrant and have a mean day-time drift towards the rth but at night they are predominantly in the north-west quadrant. Summer day-time rections were mainly in the south-east quadrant until Dec. 1956; since then they have tended the south-west after noon, reverting to the south-east about midnight. Diurnal variation speed is of the same order as the seasonal change. *Subject Headings:* **1. Ionospheric disrbances 2. F region 3. Diurnal ionospheric variations 4. Seasonal ionospheric variations.** *—Author's abstract.*

10.5–210 551.510.535:550.385

Tandberg-Hanssen, Einar (*High Altitude Obs., Boulder, Colo.*), **Variations in the height f ionospheric layers during magnetic storms.** *Journal of Geophysical Research*, Wash., D. C., 3(1):157–160, March **1958.** 5 figs., 6 refs., 4 eqs. **DLC**—The variations of the virtual eights of the F1 and E layers of the ionosphere are studied and it is found that, in general, ie E layer remains unchanged, while the F1 layer rises during geomagnetic storms. This is pplied to PARKER's theory for magnetic storms and it is concluded that the absorption of the orm-associated solar energy takes place at a height between 100 and 200 km. *Subject leadings:* **1. Ionospheric heights 2. F1 layer height-magnetic storm relationships 3. Magetic storms.**—*Author's abstract.*

10.5–211 551.510.535:551.594.13

Thomas, J. O.; Haselgrove, Jenifer and Robbins, Audrey, (*all, Cavendish Lab., Cambridge*), **he electron distribution in the ionosphere over Slough, Pt. 1, Quiet days.** *Journal of Atospheric and Terrestrial Physics*, London, 12(1):46–56, **1958.** 5 figs., 2 tables, 14 refs., eqs. **DLC**—A method of calculating the distribution of electron density with height from xperimental virtual height-frequency records using an electronic digital computer is outlined. he method assumes that the $N(h)$ curve is monotonically increasing but makes no other *priori* assumptions about the shape of the layer. It allows for the effect of the earth's agnetic field. The method has been applied to a representative selection of $h'(f)$ records ken at Slough and the F2 layer results for the International Quiet Days are presented and ompared with previous work. The height of maximum electron density in the F2 layer is und to be considerably lower than previously supposed, particularly in the summer and quinox months. Results for the F1 layer show that the peak of the layer (h_FF1) is lower than reviously supposed and that the seasonal variation of h_FF1 is the opposite to that expected r a Chapman layer. *Subject Headings:* **1. Ionospheric electron density 2. Electron density F layers 3. Slough, Eng.**—*Authors' abstract.*

10.5–212 551.510.535:551.510.62

Wait, James R. (*Natl. Bu. of Standards, Boulder, Colo.*), **An extension to the mode theory VLF ionospheric propagation.** *Journal of Geophysical Research*, Wash., D. C., 63(1):125–35, March **1958.** 9 figs., 9 refs., 10 eqs. **DLC**—The wave-guide mode theory of VLF ropagation for a sharply-bounded homogeneous ionosphere is refined to include stratification the lower edge of the ionosphere. The numerical results for a two-layer model are discussed

in detail. By choosing the upper medium to have a conductivity with a factor of 10 greate than the lower medium, the attenuation vs frequency characteristic of the model is consistei with experimental data from 1.0 to 20 kc. The effect of the finite thickness of the E laye important for frequencies less than 1.0 kc, is treated by an ionospheric model which has sharp lower edge and an exponential taper to zero at greater heights. *Subject Heading* **1. VLF radio wave propagation 2. Wave guide mode theory of VLF propagation 3. Ion spheric radio wave propagation.**—*Author's abstract.*

10.5–213 551.510.535:551.594.13:621.396.

Warwick, J. W. and Zirin, H. (*both, High Altitude Obs., Colorado Univ.*), **Diurnal absorptio in the D-region.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4):187–19 **1957.** 2 figs., 9 refs., 7 eqs. **DLC**—We have analyzed the diurnal variation of cosmic nois at a frequency of 18 Mc/s. From these records we derive the electron density as a functio of local time and height in the D-region. We also derive a one-parameter, exponential ap proximation to the vertical distribution of the ionizable constituent, nitric oxide. The electr density curves fit those derived in different ways by other groups. We predict that th recombination coefficient, within the D-region, is either constant, or increases with heigh *Subject Headings:* **1. Ionospheric electron density 2. Cosmic noise variations 3. Nitric oxid** —*Authors' abstract.*

RADIO METEOROLOGY

10.5–214 551.510.62:621.396.

Riggs, Lowell P., **An investigation of the atmospheric physical conditions associated wit microwave propagation.** Texas. Agricultural and Mechanical College, Contract AF 19(604 1564, Technical Note, No. 4, March **1958.** 65 p. 30 figs. (incl. photos), 5 tables, 20 refs., eq **DWB** (M94.7 T353te)—In an attempt to evolve procedures whereby meteorologists, usin ordinary weather observations, can predict anomalous propagation of radar energy, relatio ships between radar observations and weather factors which might reasonably be expecte to influence "trapping" have been examined. No significant correlation between any *sing* meteorological parameter and the degree of trapping could be found. Instead, as might b expected, it appears that a number of factors contribute to the degree of refraction. Th most sensitive parameter is (for the regions studied) the degree of stratification of layers fro the surface to 5000 ft alt. When the height of the low-level moisture layer reaches this altitud trapping is negligible. Procedures for the preparation of objective forecasts of anomalou propagation are presented. *Subject Headings:* **1. Microwave propagation studies 2. Micr wave refraction.**—*Author's abstract.*

10.5–215 551.510.62:621.396.

Riggs, L. P. and Bean, B. R., **Radio meteorological data available as of April 1, 195** *U. S. National Bureau of Standards, NBS Report*, 5565, April 7, **1958.** 18 p. tables. **DW** (621.384 U585ra)—The past few years have seen a rapid increase in the amount of researc on the utilization of standard weather observations for radio propagation studies, with occa sional unnecessary duplication of effort or noncompatibility of basic parameters. An effo was made to remedy this situation at the First Meeting on Radio Climatology held at th Central Radio Propagation Laboratory on Jan. 15, 1958. One of the important conclusio of this meeting was that CRPL should act as a clearing house and maintain a listing of dat obtainable from various laboratories. The present report is the first such listing of these data *Subject Headings:* **1. Radio meteorological data 2. Radio meteorological data center 3. Cen tral Radio Propagation Laboratory.**—*Authors' abstract.*

10.5–216 551.510.62:551.594.5

Stein, Sidney (*Radio Propagation Lab., Stanford, Univ., Stanford, Calif.*), **The role o F-layer tilts in detection of auroral ionization.** *Journal of Geophysical Research*, Wash., D. C 63(2):391–404, June **1958.** 6 figs., 15 refs. **DLC**—An important ionospheric mode fo detection of powerful long-range auroral reflections at Stanford depends upon appropriat tilts in the *F* layer to the north. Auroral reflections received via this mode have been reporte as originating from prevalent strongly reflecting ionized structures at great heights, betwee

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displacement-precipitation nomograms 2. Convergence line-precipitation relationshi —*M.R.*

10.5–220 551.511.33:551.513:551.551.5

Pisharoty, P. R. (*Met. Office, Poona, India*), **Unstable ridges and creation of kine energy in the atmosphere.** *Meteorological Society of Japan, Tokyo, 75th Anniversary V of the Journal*, pub. Nov. **1957.** p. 135–139. 2 figs., table, 5 refs., eqs. **DWB, DLC**—Wh height contours on a high level constant pressure (say the 300 mb) chart exhibit a strong curved anticyclonic ridge, air parcels moving even with the maximum possible gradient wir namely twice the geostrophic wind, cannot follow the contours and instead will be forced move from higher to lower contours and thereby acquire appreciable amounts of kinet energy. Studies with the machine-processed daily wind data of the Northern Hemisphere f Jan. and Feb., 1949, have enabled the author to compute the day-to-day net production large-scale-eddy kinetic energy in complete zonal belts around the globe, allowing for (a) t convergence of the flux of the eddy kinetic energy across the latitudinal walls and (b) t conversion of the eddy kinetic energy into the mean zonal kinetic energy by the action of t eddy stresses. On a few instances of very large net production of large-scale-eddy kinet energy at the 300 mb level, at lat. 45°N, it was found that nearly a third of it was accountab by the cross-contour flow necessitated by a well marked anticyclonic ridge near the Canadia Pacific coast. It is likely that such unstable ridges play a role in the generation of "velocit maxima" along the meandering axis of a well-developed "jet stream" of the middle latitude *Subject Headings:* **1. Kinetic energy in atmosphere 2. Machine data analysis.**—*Autho abstract.*

10.5–221 551.511.32:551.551.2:551.594.

Kawano, M. (*Electrotechnical Lab., Tokyo*), **The coefficient of eddy diffusivity estimate by the method of atmospheric electricity.** *Meteorological Society of Japan, Journal*, Ser. 35(6):339–342, Dec. **1957.** 6 figs., 5 refs., 7 eqs. **DWB**—The relation between atmospher electric field and the coefficient of eddy diffusivity is discussed under the following assumption 1) the vertical distribution of the space charge is controlled by eddy diffusion near the grou and 2) the space charge transported into a unit volume of the atmosphere by eddy diffusio is balanced by the space charge dissipated by the atmospheric electric conductivity in t same unit volume. Using observed values of atmospheric electric field, conductivity an space charge at Hongo, the diurnal variation of the coefficient of eddy diffusivity in eac season is estimated. The result is 5×10^4 cm²/sec in the daytime and 5×10^3 cm²/sec at nigh *Subject Headings:* **1. Eddy diffusivity coefficient 2. Electrical conductivity of air.**—*Autho abstract.*

10.5–222 551.511.32:551.513

Oi, Masamichi (*Osaka Gakugei Univ., Osaka*), **Steady topographical perturbation of zonal current.** *Meteorological Society of Japan, Tokyo, 75th Anniversary Vol. of the Journa* pub. Nov. **1957.** p. 119–125. fig., table, 8 refs., 24 eqs. **DWB, DLC**—It is shown tha middle-scale quasi-stationary disturbances of the middle latitude zonal current are produce by the forced ascent of the zonal current, not only over the mountain range (continenta land masses, submarine topographies or aero-topographical barriers, etc.) but also both up stream and downstream. In other words, the remote effect of the forced ascent of a zona current is studied in synoptic scale. *Subject Headings:* **1. Zonal currents 2. Orographi effects on zonal current.**—*Author's abstract.*

10.5–223 551.511.33 551.508.5

Suomi, V. E., **Energy budget studies at the earth's surface and development of the son anemometer for power spectrum analysis.** Wisconsin. Univ. Dept. of Meteorology, Contra AF 19(122)-461, [Unnumbered Report], **1956.** Section 1. 57+26 p. numerous figs tables, refs., eqs.—This report summarizes the work done on Air Force Contract AF 19(122)-4 which covers studies of heat and energy budget of the lower atmosphere. Studies includ (1) Measurement of energy balance at the earth-air interface with special use of Bowen rat technique and (2) Theory and constructional details of a sonic anemometer whose developme

s completed under the contract. It measures the space average component of the wind ng the axis of the acoustic array. Its error is less than 2% when the total wind is less than mph and, by it, a variable area of 39 (or 16) mm film is obtained—similar to the motion ture sound track. Any fluctuation of temperature by using this instrument becomes able when the total wind fluctuation is less than 5 m/sec. In addition, a description is en of the power spectrum analysis from some variable area record film. Circuit and nstruction details of the sonic anemometer and thermometer are given in an appendix. *bject Headings:* **1. Energy budget 2. Energy exchange earth-atmosphere 3. Sonic ane- meters.**—*N.N.*

10.5–224 551.511.33:551.513.1

Suzuki, Eiichi, (*Met. Res. Inst., Tokyo*), **Energy equation of the atmosphere and irre- rsible reciprocity theorem in statistical mechanics.** *Meteorological Society of Japan, Tokyo, h Anniversary Vol. of the Journal*, pub. Nov. **1957.** p. 271–274. 12 refs., 4 eqs. **DWB, C**—The thermodynamics and the statistical mechanics of irreversible processes have been narkably developed in recent years, and their applications to the various scientific fields ve been made by many authors, especially in electro-communication theory. The author ends to develop and apply modern statistical mechanics to fundamental meteorological nation. Modern developments in irreversible processes and statistical mechanics have en introduced into meteorology by M. YOSITAKE (2). He states that the theory of long range ather forecasting could not be effectively promoted without sufficient understanding of the eversible phenomena in thermodynamics. In this paper, the author investigated the relation energy equation of the atmosphere to the irreversible reciprocity theorem developed by NSAGER and PRIGOGINE. *Subject Headings:* **1. Irreversible processes in meteorology 2. Sta- tical mechanics in meteorology.**—*Author's abstract.*

10.5–225 551.511.33:551.513

Abdullah, Abdul J. (*Higher Teachers' College, Baghdad, Iraq*), **Rate of transmission of chanical energy by the waves of the westerlies.** *Iraqi Scientific Societies, Baghdad, Iraq, oceedings*, Vol. 1:20–26, **1957.** table, 7 refs., 26 eqs.—In this paper an attempt is made to mpute, directly, the rate of transmission of mechanical energy by the waves in the westerlies. ie same assumptions made by ROSSBY and HAURWITZ, in their work on these waves, are rried out here without any attempt to change them. A formula is deduced for this rate, hich is assumed to be identical with the speed of the observed troughs and ridges at higher els. This formula is then verified by comparison with a case study. The agreement tween theory and observation is found to be encouraging. *Subject Headings:* **1. Energy nsfer 2. Waves in the westerlies.**—*Author's abstract.*

10.5–226 551.511.6:551.551.21

Panofsky, H. A.; Cramer, H. E. and Rao, V. R. K. (*all, Pennsylvania State Univ.*), **The lation between Eulerian time and space spectra.** *Royal Meteorological Society, Quarterly urnal*, London, 84(361):270–273, July **1958.** fig., 3 tables, 11 refs. **DWB, DLC**—Simul- neous observations of space correlations and time correlations verify that TAYLOR's hy- thesis $x = Ut$ is valid for intervals up to at least 90 m, and for relative intensities of tur- lence at least up to 0.26. It is also shown that, when the stratification is stable, the longi- dinal scale of turbulence tends to be much larger along the flow than across it. In an stable layer, the scale is of the same order of magnitude in all directions. *Subject Headings:* **Eulerian time-space relationships 2. Turbulence spectrum.**—*Authors' abstract.*

10.5–227 551.511.6:551.515.81:551.573

Tseĭtin, G. Kh., **Nekotorye voprosy transformatsii vozdushnykh mass i teorii isspareniia.** [Problems in air mass transformation and evaporation theory.] *Leningrad. Glavnaia eofizicheskaia Observatoriia, Trudy*, No. 71:169–183, **1957.** 2 figs., tables, 14 refs., 68 eqs. **WB** (M(055) U581tG)—The solution of the problem involving the transformation of air asses under the influence of wind velocity profiles, coefficients of turbulent diffusion and rious limiting conditions of the underlying surface is presented. The wind velocity and the

coefficients of turbulent diffusion (both horizontal and vertical) are taken as power functio of height up to a certain level, above which they are regarded as constants. The limiti conditions on the underlying surface are given in the formula

$$-k_z \frac{dq}{dz} = \varphi(x,y) - A\,[q(x,y,z)_{z=0} - \varphi(x,y)],$$

where q—substance of air mass undergoing transformation and A—constant. The equati of stationary turbulence diffusion

$$u\frac{dq}{dx} = \frac{\partial}{\partial y}k_y + \frac{\partial q}{\partial y} + \frac{\partial}{\partial z}k_z\frac{\partial q}{\partial z}$$

for these limiting conditions is integrated by the method of Fourier and a general operation method. Also an expression for local evaporation is derived if the relative humidity under t air mass is taken into account. From the general solution special partial solutions for t transformation of an air mass are derived. These include the role in horizontal turbule mixing of the distribution of moisture over a limited body of water and local evaporation fr the surface in case of a square and a rectangular body of water; total evaporation from limit bodies of water (rectangular reservoirs) and approximate determination of reduction coef cients of evaporators (square or circular). *Subject Headings:* **1. Air mass transformati 2. Turbulent diffusion 3. Evaporation from water surfaces.**—*I.L.D.*

GENERAL CIRCULATION

See also: **Kinetic energy in atmos.** (Pisharoty), 10.5–220; **Orographic eff. on zonal currents** (Oi), 10.5–222; **Irreversible processes in met.** (Suzuki), 10.5–224; **Waves in the Westerlies** (Abdullah), 10.5–225; **Cool summer, 1958, U. S.** (O'Connor), 10.5–265; **Bai-u circulation and circulation over Asia** (Dao), 10.5–296.

10.5–228 551.513(

Academia Sinica, Peking. Institute of Geophysics and Meteorology, **On the gener circulation over Eastern Asia, Pt. 1, Pt. 2.** *Tellus*, Stockholm, 9(4):432–446, Nov. 195 14 figs.; 10(1):58–75, Feb. 1958, 17 refs. **DWB**—In Pt. 1 the mean field of motion in the low troposphere over the Far East is considered. Mean cross sections for winter and summer a for different latitudes are discussed. In Pt. 2 the actual situations encountered in the differe seasons are discussed and examples given. *Subject Headings:* **1. General circulation 2. Ea Asia.**—*Author's abstract.*

10.5–229 551.5

Brückmann, Walter, **Die allgemeine Zirkulation der Atmosphäre.** [General circulatio of the atmosphere.] *Meteorologische Rundschau*, Berlin, 10(5):156–157, Sept./Oct. 195 **DWB, DLC**—The author attempts to explain the general circulation of the atmosphere purely dynamic terms and not in the customary manner as a phenomenon determined by t thermal and pressure characteristics of the atmosphere. The conception that the atmosphe is stationary but that the rotating earth imparts to it motion is regarded as erroneous. Inste the author maintains that the atmosphere contains fundamental currents and that moveme is the primordial state of the atmosphere, consisting of an E-W flow between 30°N and 30 lat. adjoining zones with frequent absence of movement and W-E flow in the middle and high latitudes. The further characteristics of the atmospheric motion are determined then by t mechanical obstructions of the earth's surface, namely the convergence of the meridians a conditions of external and internal friction. The modifying and influencing role of the te perature and pressure inequalities, the tides and radiation are discussed briefly. The theo is formulated nonmathematically. *Subject Heading:* **1. General circulation.**—*I.L.D.*

10.5–230 550.386:523.74:551.5

Gabilly, A., **Activité magnétique, activité solaire et circulation générale.** [Magnet activity, solar activity and general circulation.] *La Météorologie*, Paris, Ser. 4, No. 50:109–12 April/June 1958. 12 figs., 7 refs. French, English and Spanish summaries p. 109. **DWB**

he general circulation has been defined by zonal indices, in the neighborhood of Western urope, as a function of the magnetic activity given by the ursigrams of solar activity considered first from the viewpoint of chromospheric eruptions (in connection with magnetic orms and sudden variations of declination). The only characteristic link discovered among ose phenomena was an increased probability of zonal circulation, in the hemisphere portion cluding North Atlantic and Western Europe, between the 13th and 18th day following a agnetic disturbance following on a chromospheric eruption. In that same geographical area, arch was made for differences likely to exist, on charts of monthly anomalies of pressure, uring the cold season from Dec. to March, at maximum or minimum periods of sun spots. he differences seen are not systematic and vary greatly according to the month considered. *ubject Headings:* **1. Magnetic activity 2. Solar activity 3. Chromospheric eruptions General circulation.**—*Author's abstract.*

10.5–231 551.513

†Lamb, H. H. (*Gt. Brit., Met. Off.*), **The southern circumpolar westerlies: broad characteristics and apparent associations.** *Great Britain. Meteorological Research Committee, M.R.P.* 065, Aug. 14, **1957.** 17 p. 14 figs., table, 51 refs. **DWB** (M(055) G786m)—The data vailable suggest that the Southern Hemisphere westerlies carry much more momentum than eir northern counterparts, possibly by as much as a factor of nearly two over the year as a hole. The system appears to be the most energetic limb of the atmospheric circulation, nd it may be useful to regard it as the "flywheel" and a sort of (partial) "governor." Preliminary survey at the 500 mb level shows the main trough south of 40°S in the Indian Ocean ctor, centered about 100°–110°E at most seasons of the year, and the main ridge in the estern Pacific in the neighborhood of the outer reaches of the Ross Sea. The control of rough and ridge positions appears to be thermal rather than orographic, associated with the osition of the broadest part of the Antarctic cooling surface. The pattern of glaciation, as ell as available data on depression tracks and anticyclone distribution over the Southern cean, support the pattern of ridges and troughs at 500 mb and throw light upon the occurrence blocking in various sectors of the Southern Hemisphere. An important proposition suggests self from this study, namely, that it may be the momentum and energy of the southern esterlies which are ultimately responsible for maintaining the meteorological equator on verage north of the true equator, at least over the oceans. *Subject Heading:* **1. Southern emisphere westerlies.**—*From author's abstract.*

10.5–232 551.513.1:551.515(479)

Gogishvili, K. S., **O nekotorykh osobennostiakh atmosfernykh protsessov, prepiatstvuiushchikh proniknoveniiu kholodnogo vozdukha na iug Kavkaza.** [On certain peculiarities of tmospheric processes preventing the penetration of cold air to the southern Caucasus.] *Meteorologiia i Gidrologiia*, Leningrad, No. 3:37–40, March **1957.** 3 figs., 4 refs. **DWB, LC.** Trans. available. **DWB** (M09.53 G613on)—An analysis of the causes which prevent he spread of cold waves southwards into the southern Caucasus. The cold waves are associated with three polar, ultra-polar and eastern (influence of Asiatic anticyclone) synoptic rocesses. It is shown with the aid of pressure-temperature maps that the penetration of olar air is hindered by the spread of high ridge of heat from the eastern Mediterranean to the lack Sea so that warm air flows over the Caucasus from the W. to the S.W. and by the presence a cyclone center over northern Italy so that a large part of the cold air reaching Europe from he N.W. alters its direction and flows S.W. In the case of the ultrapolar processes, cold waves re blocked by the high warm ridge over western European U.S.S.R. and the Caucasus and he associated cold flow inclines more to the east than to the southeast when passing the southrn Caucasus, and the high quasistationary anticyclone over S.W. Europe centered over the Balkans, and by the absence of cyclonic activity over the Black Sea and south of it. Finally, the case of the "eastern" type, cold waves are blocked by the almost stationary anticyclone ver Siberia because the eastward flow on the eastern periphery cannot develop due to the bsence of a deepening cyclone over the regions of the Caspian and Aral Seas, by the spread of eat over the entire northwestern periphery of the Asiatic anticyclone, and the isolation of he cold center north of the Caspian Sea. *Subject Headings:* **1. Blocking action 2. Cold waves Southern Caucasus.**—*I.L.D.*

10.5–233 551.513.1:551.511.

Lorenz, Edward N. (*M. I. T. Dept. of Met.*), **Static stability and atmospheric energ** Massachusetts Institute of Technology. Dept. of Meteorology, Contract AF 19(604)-10 (General Circulation Project), Scientific Report, No. 9, April 30, **1957.** 41 p. 19 refs., 71 e Also his: **Static stability. . . .** (In: Massachusetts Institute of Technology. Dept. of Mete ology, Contract AF 19(604)-1000, Final Report, Dec. 31, **1957.** p. 450–490. 19 refs., 71 eq **DWB**—The process primarily responsible for the release of kinetic energy in the atmosphe a rising of warmer air and a simultaneous sinking of colder air, also increases static stabili There is a net dissipation of kinetic energy by adiabatic processes, and hence a net increase gross static stability by nonadiabatic heating and cooling. Current estimates of friction dissipation are consistent with a net nonadiabatic cooling of about 0.3°C per day near t tropopause. The increase of static stability accompanying the development of a disturban causes an increase in dynamic stability, which tends to inhibit further growth of the disturban *Subject Headings:* **1. Static stability 2. Kinetic energy in atmosphere 3. Adiabatic process** —*From author's abstract.*

ATMOSPHERIC DISTURBANCES

See also: **Glider flights, Switz.** (R.H.), 10.5–124; **Hurricane damage and forest management** (Jones), 10.5–126; **Thunderstorms, Moscow** (Gorodova), 10.5–180; **Frontal analysis** (Koo et al.), 10.5–183; **Cyclone distrib., Southern Ocean** (Langford), 10.5–185; **Kinetic energy in atmos.** (Pisharoty), 10.5–220; **Air mass transformation and evapor. theory** (Tseĭtin), 10.5–227; **Thunderstorm and fog frequencies, Sentier, Switzerland** (Bouët), 10.5–290; **Rainfall intensity-thunderstorm relationships** (Muchnik), 10.5–299; **Rainfall-typhoon relationships, Saga Prefecture, Japan,** 10.5–300; **Electrical conductivity of air and thunderstorm electricity** (Hatakeyama), 10.5–333.

10.5–234 551.515.2:551.511.2(26

Gōda, I., **Relation between distribution of vorticity advection at high level and path typhoon.** *Journal of Meteorological Research*, Tokyo, 10(2):88–95, Feb. **1958.** 12 figs., 6 ref 6 eqs. **DWB, DLC**—The author examined the paths of typhoons from 1954 to 1956, in relati to the position or the displacement of positive area of the vorticity advection

$$u\frac{\partial \zeta}{\partial x}+v\frac{\partial \zeta}{\partial y}\left(=V\frac{\partial \zeta}{\partial s}\right)$$

at 300 mb level, where u and v indicate the wind components, ζ the relative vorticity, V t total velocity of wind and s the length along a stream line. Results are shown in figs. *Subj Headings:* **1. Vorticity advection-typhoon relationships 2. Typhoon tracks.**—*Author's abstra*

10.5–235 551.515.2:551.509.313:551.511.

Masuda, Y. (*Met. Res. Inst., Tokyo*), **On a method for solving the balance equation typhoon region.** *Papers in Meteorology and Geophysics*, Tokyo, 8(1):55–64, April 195 9 figs., 7 refs., 23 eqs. **DWB**—In order to avoid the truncation errors near the typhoon cent which arise in the course of numerical computation, and to obtain the stream function in t vicinity of typhoon precisely, the balance equation is separated into two parts; one correspon ing to the circular symmetric field and the other, to the residual field. The stream functi corresponding to the circular symmetric field is easily obtained by the gradient wind equatio After the condition for existence of solutions of the balance equation corresponding to t residual field is examined, the point relaxation procedure to solve this equation is propose An example of this solving method, applying to typhoon "Harriet," is presented also. *Subj Headings:* **1. Balance equation 2. Numerical typhoon forecasting.**—*Author's abstract.*

10.5–236 551.515.2:551.558.29:551.511.

Masui, T., (*Yokohama Natl. Univ., Japan*), **On the potential temperature field of typhoo** *Meteorological Society of Japan, Tokyo, 75th Anniversary Vol. of the Journal*, pub. Nov. 195 p. 323–329. 16 figs., 9 refs. **DWB, DLC**—As a result of the investigation of the distributio of potential temperature field in the typhoons which passed over Japan in recent years, diagra of horizontal distribution of the vertical motion on 150 mb surface were constructed. *Subj*

Headings: **1. Potential temperature field of typhoons 2. Typhoon temperature.**—*Author's abstract.*

10.5–237 551.515.2:532.593

Unoki, S. (*Oceanog. Lab., Met. Res. Inst., Tokyo*), **Mean distribution of wave heights and periods (On the ocean waves due to tropical cyclones, Pt. 3).** *Meteorological Society of Japan, Tokyo, Journal*, Ser. 2, 35(5):297–309, Oct. **1957.** 9 figs., 5 tables, 11 refs., 5 eqs. **DWB, DLC**—Arranging various kinds of wave materials obtained by visual observations from weather ships or military planes for ninety five typhoons, several maps showing the mean distribution of wave heights and periods were constructed, and the relation of wave heights and periods to the speed and the central pressure of the storm center was discussed. Moreover, the rate of decrease of waves with the distance from the storm center and the difference of wave distribution among quadrants in the storm were investigated. From the results thus obtained, empirical formulas and diagrams were derived, which will serve as a first approximation for the calculation of wave heights and periods, although discrepancies between calculated and observed values are not always small because of the variety of wave distribution and the complicated spectral structure of storm waves. *Subject Headings:* **1. Ocean waves in typhoons 2. Typhoon wave studies.**—*Author's abstract.*

10.5–238 551.515.23:551.501.81:551.577.37

Ushijima, T. (*Fukuoka Met. Obs.*), **Outer rain bands of typhoons.** *Meteorological Society of Japan, Tokyo, Journal*, Ser. 2, 36(1):1–10, Feb. **1958.** 12 figs., 4 tables, 10 refs. **DWB, DLC**—Some features of the outer rain bands of typhoons are studied. A schematic illustration of surface pressure pattern in a typhoon is presented through the analysis of weather elements. It is shown from the radar echo analysis that the velocity of precipitation cells in rain bands is approximately equal to the resultant velocity of typhoon system and gradient wind, and that this fact may be used for the prognosis of movement of typhoons. *Subject Headings:* **1. Typhoon rainfall structure 2. Typhoon movement forecasting 3. Radar analysis of typhoon rainfall.**—*Author's abstract.*

10.5–239 551.515.21:551.577.37(51)

Liu, Kwang-nan (*Inst. of Geophysics and Met., Academia Sinica*) and Tung, Ke-chin (*Central Met. Obs.*), **The structure and rainfall distribution of the typhoons invading South of China.** *Acta Meteorologica Sinica*, Peking, 29(2):104–118, May **1958.** 18 figs., 2 tables, refs. In Chinese; English summary p. 118. **DWB**—Based on the comparatively complete surface data we have analyzed the distributions of pressure, wind, and rainfall weather, as well as their interrelations with four intense typhoons which invaded the continent. The main results are as follows: (1) The pressure distribution within a typhoon varies considerably with its direction of motion. The filling of a typhoon is a function of its radius. (2) The wind distribution within a typhoon is considerably influenced by the earth's topography. The distribution of convergence agrees well with the rainfall distribution. (3) After invading the continent, the rainfall distribution may be classified into three types: namely, symmetrical type, asymmetrical type and according to the stage of its development. (4) Just after invading the continent there are two entirely different types of weather near the center of a typhoon: a) clear and quiet weather and (b) violent rainfall. In conclusion, the structure of a typhoon changes considerably when it enters the westerlies from the easterlies. On the other hand its structure is influenced appreciably by the land and sea and the earth's topography. *Subject Headings:* **1. Typhoon structure 2. Typhoon precipitation distribution 3. South China.**—*Authors' abstract.*

10.5–240 551.515.23(529)

[Formosa. Weather Forecasting and Research Center], **Report on Typhoon "Carmen."** *Meteorological Bulletin*, Taipei, Formosa, 3(4):20–26, Dec. **1957.** 14 figs., 2 tables. In Chinese; English summary p. 20. **DLC** (Orientalia)—Among five typhoons of this fall, "Carmen" was the worst that threatened and damaged this island when it hit here last Sept. It formed about 400 km to the southeast of Taiwan and then stayed over the sea, southeast of this island. Its tracks changed frequently and lasted for five days, thus causing serious

damage over the land. This paper describes the development of its path and actual dama done by this typhoon. Due to the intensive intrusion of a Continental High, the moveme of this typhoon was abnormal. *Subject Headings:* **1. Typhoon "Carmen" (1957) 2. Typho movement 3. Typhoon damage 4. Formosa.**—*Author's abstract.*

10.5–241 551.515.23(529,5

[Formosa. Weather Forecasting and Research Center], **Report on Typhoon "Faye and Typhoon "Gloria."** *Meteorological Bulletin*, Taipei, Formosa, 3(4):27–29, Dec. 195 5 figs. In Chinese; English summary p. 27. **DLC** (Orientalia)—Typhoons "Faye" a "Gloria" formed at some distance to the east of the Philippine Is. during last Sept. Typho "Faye" had merely a moderate intensity when it approached the east cost of Taiwan a intensified again when the storm hit Naba with a gust of 140 mph. Typhoon "Gloria" mai tained a northwesterly direction after it started its whirling in the Pacific. This typho caused great damage in Hong-Kong when it reached the continent near the vicinity southwe of the island. In this paper, the writer gives a full discussion of the trajectory and its develo ment for each typhoon mentioned above, but had only a scanty report on the details of the damage. *Subject Headings:* **1. Typhoon "Faye" (1957) 2. Typhoon "Gloria" (1957) 3. T phoon tracks 4. Taiwan, Formosa 5. Hong Kong.**—*Author's abstract.*

10.5–242 551.515.23(52

[Formosa. Weather Forecasting and Research Center], **Report on Typhoon "Virginia** *Meteorological Bulletin*, Taipei, Formosa, 3(3):20–27, Sept. **1957.** 22 figs., table. In Chines English summary p. 20. **DLC** (Orientalia)—As to the tilt of a typhoon passing through t vicinity of Taiwan, the following facts are pointed out; (1) the vertical axis of the horizont cyclonic circulation center at different levels of a typhoon inclines toward the directi of the future movement of the typhoon. (2) the breakdown of the tilt into two parts is t first indication of recurvature of the typhoon track. A proper forecast of the recurvatur of Typhoon "Virginia" was issued by using these concepts, together with the help of la radar weather reports, and hourly report of surface wind direction and force, and the pressu change curves of several stations scattered from north to south ahead of the typhoon trac Surface pressure and wind velocity distribution charts during major synoptic hours are pr sented in order to point out the genesis of the induced low pressure areas, and the variati of the area of wind velocities less than 10 km in central Taiwan during the typhoon passag *Subject Headings:* **1. Typhoon "Virginia" (1957) 2. Recurvature of typhoons 3. Typho tracks 4. Taiwan, Formosa.**—*Author's abstract.*

10.5–243 551.515.3(26

Kilday, Gordon D. (*WBAS, Juneau, Alaska*), **Rare waterspouts in Alaska.** *Month Weather Review*, Wash., D. C., 85(8):281, Aug. **1957. DWB, DLC**—Two distinct spou observed on Aug. 19, 1957 between 0900 and 1045 PST in Cross Sound, 20 mi S.W. of Ca Spencer Light, Alaska. Several other spouts were being formed at the time, as downwa extensions of a cloud base at about 1000 ft. A cold trough lay over the eastern Gulf of Alask and a cold cut-off Low over the southeastern Gulf. Moist unstable air extended from 900 600 mb and an isothermal layer from the surface to 900 mb. Average lapse rates >4°F/1000 Heavy showers and lightning were observed in area previously. Abnormally high sea te peratures were reported in eastern Gulf; 64°F between Cape Ommaney and Cape St. Eli *Subject Headings:* **1. Waterspout observation 2. Cape Spencer Light, Alaska.**—*M.R.*

10.5–244 551.515.4(234

Ermini, Virgilio, **I temporali sul versante Italiano delle Alpi centro-occident** [Thunderstorms on the Italian slopes of the West Central Alps.] *Rivista di Meteorolo Aeronautica*, Rome, 18(2):27–39, April/June **1958.** 7 figs., 7 tables, 7 refs. Italian, Fren English and German summaries p. 27. **DLC**—Based on data collected at some mounta stations, during 5–8 yrs and on data observed from an airplane, the behavior of stormy da and other characteristics concerning the storm phenomena in the highest area of the w central Alps, are studied. *Subject Headings:* **1. Alpine thunderstorms 2. Italian Alps** *Author's abstract.*

10.5–245 551.515.4(47)

*Lebedev, A. N., **Veroiatnost' groz na ogranichennykh uchastkakh territorii.** [Thunderstorm probability over limited areas.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 74:61–70, **1957.** 4 figs., 4 tables, 6 refs. **DWB** (M(055) U581tg)—In order to determine the variation of the probabilities of thunderstorms over some limited areas as compared with their probability at the point of observation, the meteorological data at 120 stations, situated in the region of the Privolga highlands and Central and Lower Volga, were analyzed for the months of June, July and Aug. 1946–1950. Data are presented on the probability of number of days with thunderstorms by station, by district and by four districts together, mean number of days with thunderstorms at a point in the district with a radius of 100 km and the mean number of days with thunderstorms in percent of the total number of days per month in a district with a radius of 200 km. From the number of days with thunderstorms at a point, it is impossible to obtain a complete idea of thunderstorm activity within the limits of a portion of an area. During the summer months the number of days with thunderstorms at a point of observation is 2 to 3 times less than over a 100 km radius and 3–4 times less than over a 200 km radius. This conclusion holds for all the European part of the U.S.S.R., including the mountainous districts. The climatic probability of number of days with thunderstorms for the Volga region is for a point 20–25% in July, and 10–20% in June and August, for areas with a radius of 100 km the probability of the number of days with thunderstorms rises to 56–65% in June and July; in August the number of days with thunderstorms drops to 30–40%. In a radius of 200 km the probability of the number of days with thunderstorms is still higher. *Subject Headings:* **1. Thunderstorm probabilities 2. Thunderstorm data 3. European U. S. S.R.**—*I.L.D.*

10.5–246 551.515.4:551.511.1(495)

Papagianakis, S. D., **L'instabilité atmosphérique dans la région d'Athènes pendant l'été.** [Atmospheric instability in the Athens area in summer.] *La Météorologie*, Paris, Ser. 4, No. 44:363–369, Oct./Dec. **1956.** 5 tables, 2 refs. French, English and Spanish summaries p. 363. **DWB**—In this study of summer thunder showers and storms in the vicinity of Athens, stability indices were computed not only for the 500 mb level (Showalter Stability Index) but also stability indices for the 1000 to 700 mb layer, 950 to 700 mb layer, 850 to the 700 mb layer and the 700 to the 500 mb layer. The 850 to 700 mb gives as good an index as the Showalter Index (850–500 mb). Data are presented on stability indices for 850–700 mb and 850–500 mb at 1500 hours for days of good weather, on the diurnal variation of the stability index in good weather, stability indices during showers and thunderstorms for 850–700 mb and for 850 to 500 mb and stability indices for cloudy weather without showers or thunderstorms for 850–700 mb and 850–500 mb and variations of stability indices during the passage of a cold front. For 91% of the cases when one considers the stability index of the 850 to 700 mb layer the stability index is $\leq +2.0°C$ and temperature-dew point difference is $\leq 6.0°C$. If days of good weather of long duration are excluded and an index of negative or zero stability is accepted as a sufficient element for forecasting storms, the probability of success is 72% for a stability index 850–700 mb and almost the same for the stability index 850–500 mb. *Subject Headings:* **1. Showalter's Stability Index 2. Stability index 3. Thunderstorms 4. Athens, Greece.**—*I.L.D.*

10.5–247 551.515.7:551.511.32(265)

§Arizumi, N. and Nakamura, S. (*both, Japan Met. Agency, Tokyo*), **On the warm high in Okhotsk Sea observed in June, 1949.** *Meteorological Society of Japan, Tokyo, 75th Anniversary Vol. of the Journal*, pub. Nov. **1957.** p. 237–242. 5 figs., 6 refs., 3 eqs. **DWB, DLC**—June 8–8, 1949 were International Meteorological Days and a warm high was observed over the Sea of Okhotsk in this period. In this paper, this warm high is analyzed with cross sections through the troposphere, and it is suggested that the turning term in the equation of vorticity would play an important role in the formation of the warm high. *Subject Headings:* **1. Warm anticyclones 2. Sea of Okhotsk.**—*Authors' abstract.*

10.5–248 551.515.71:551.511.2(470)

Borisova, E. I. and Khazova, O. N., **Povtoriaemost' nekotorykh tipov statsionarnykh antitsiklonov.** [Recurrence of certain types of stationary anticyclones.] *Moscow. Tsentral'-*

nyĭ Institut Prognozov, Trudy, No. 56:31–70, **1957.** 12 figs., 17 tables, 7 refs. **DLC**—Fro ten years of data analyzed by surface and 500 mb charts, all cases of stationary anticyclon characterized by almost stationary formations with closed isobars at AT_{500} and by an indepen ent heat source on 500-1000 mb charts were selected. At the earth's surface this formatic must retain its intensity for a specified period. The velocity of the anticyclones did not exce 10–14 km/h in 84% of the cases and 16–18 km/h in 16%. The 196 cases analyzed on the bas of synoptic kinematic maps and AT_{500} maps were typed and classified on the basis of synopt processes. Analagous processes were established by visual comparison of homogeneou development of processes and by computing the area over which pressure fields similar to th initial processes were established. Ten types of processes characterized on the basis of hig altitude and slowly moving anticyclones are described in detail with the aid of synopti kinematic maps. Processes with high altitude and stationary anticyclones, that do n weaken for several days, are observed comparatively rarely; over a period of ten years thes formations occurred in particular regions of European Russia and southern Siberia. Stationa anticyclones satisfying these conditions are observed most frequently over the British Isles an over European Russia; they are relatively rare in the northern seas. The synoptic processe characterizing stationary anticyclones in particular regions have a high frequency of ever ± 120 days from the initial process with a shift of ± 3 days; this rhythm is not observed in th northern seas and over the Taimyr Peninsula. In the first seven types of stationary ant cyclones with a 120 day period, the criteria of analogousness were determined by computi the coincidence of the pressure field sign over the Atlantic and continental Europe with th establishment of analogous processes every 120 days. A process was analogous when th displacement of fundamental pressure systems was analogous to the bench mark initial proce and the coincidence of the pressure field sign for the first natural synoptic region compris at least 70% of the total area. Stationary anticyclones of the first type are most frequent winter and of the second type in summer. The frequency of analagous processes with a 1 day period was established for each type of anticyclone and the frequencies close to mea natural probability were computed. *Subject Headings:* **1. Stationary anticyclones 2. Eur pean U.S.S.R.**—*I.L.D.*

10.5–249 551.515.

Di Benedetto F., **Un metodo obiettivo per la determinazione della subsidenza ne anticicloni dinamici.** [An objective method for determining subsidence in dynamic an cyclones.] *Annali di Geofisica*, Rome, 10(1/2):89–96, **1957.** 5 figs., 11 eqs., 24 refs. Itali and English summaries p. 95. **DLC**—A brief summary of the principal research work anticyclones done by other authors is first given and an analytic expression is then found f the objective determination of the velocity of the vertical descending currents (anticyclo subsidence). It is found that this expression is a function of parameters which are eas determined from meteorological charts and from one sounding in the anticyclonic area. T formula is then applied to a practical synoptic situation, in order to illustrate the meth described. *Subject Heading:* **1. Anticyclonic subsidence.**—*Author's abstract.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Atmos. optics texts.** (Piaskovskaia-Fesenkova), 10.5–18; **Satellite tracking,** 10.5–49; **Skin sensitivity meas.** (Generalov), 10.5–158; **Silver iodide decay** (Sano, Fukuta), 10.5–197; **Special bibliog. on ozone,** p. 759.

10.5–250 551.521.3:551.52

Boguslavskiĭ, S. G., **Poglashchenie solnechnoĭ radiatsii v more i ego neposredstvenn vliianie na izmeneniia temperatury moria.** [Solar radiation absorption in the sea and direct effect on sea temperatures.] *Akademiia Nauk SSSR. Morskoĭ Gidrofiziches Institut, Trudy*, 8:80–97, **1956.** 6 figs., 5 tables, 5 refs., 6 eqs. **DLC**—Methods and resu of a study of underwater radiation, and its effect on the warming up of sea temperatures

arious depths (down to 25 m), carried out in July 1951 with a specially constructed underwater yranometer. It was found that the increase of temperature, owing to solar radiation absorption, amounts to 90% of the overall temperature change at 1 m depth, to 50% at 5 m depth, o 25% at 10 m depth, and to 11% at 25 m depth. *Subject Headings:* **1. Solar radiation bsorption 2. Absorption by sea water 3. Solar radiation effects on sea temperatures . Underwater pyranometers.**—*A.M.P.*

10.5–251 551.521.3

Krasikov, P. N., **O snizhenii dlinnovolnovogo izlucheniia dymom krasnogo fosfora.** [Attenuation of long-wave radiation by fumes of red phosphorus.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, 57(119):108–110, **1956.** 2 tables, 5 refs., eqs. **DLC**—The lowering of effective radiation by smoke can be computed by the equation

$$\Delta Q = Q_e(1 - 10^{-\alpha\gamma h}),$$

where $\Delta Q = Q - Q_e$ and Q and Q_e are the effective radiation in pure air and in smoke, respectively, α—coefficient of attenuation of heat radiation in g^{-1} cm^3, γ—weight of smoke in g cm^{-3} and h—thickness of smoke in cm. Red phosphorus was burned under experimental conditions to determine DQ/Q_e and γ in order to determine α. It is shown that the effectiveness of phosphorus smoke is not influenced by relative humidity. Also a smoke coefficient, involving the relationship of the phase of the smoke to the mass burned, indicates the effectiveness of red phosphorus in the attenuation of heat radiation. *Subject Headings:* **1. Radiation attenuation by smoke 2. Effective radiation.**—*I.L.D.*

10.5–252 551.521.64

Vavilov, Iu. N., **Ob interpretatsii prostranstvennogo raspredeleniia iadernoaktivnykh chastits v shirokikh atmosfernykh livniakh.** [On interpretation of the lateral distribution of nuclear-active particles in extensive air showers.] *Zhurnal Eksperimental'noĭ i Teoreticheskoĭ Fiziki*, Moscow, 33(1):179–182, July **1957.** 14 refs., 8 eqs. **DLC** (QC1.Z47). Transl. into English by H. Kasha in *Soviet Physics JETP* (American Institute of Physics), N. Y., 6(1):141–144, Jan. **1958.** refs., etc. **DLC**—Experimental data referring to the shape of the lateral distribution curve of nuclear-active particles near the axis of extensive showers are considered. The data indicate a small value of the averaged minimum angles of emission of nuclear-active particles responsible for generation of the nuclear-active particles directly recorded in the experiments ($<4\times10^{-3}$ radian). It is shown that LANDAU's theory of multiple particle production can yield such a small value for the emission angle only if it simultaneously predicts a high degree of concentration of energy of the incident particle on a single secondary particle in an elementary act of the nuclear cascade process at energies of 10^{12}—10^{15} ev. *Subject Headings:* **1. Cosmic ray showers 2. Landau theory 3. Cosmic ray-nuclear-active particle relationship.**—*Trans. of Author's abstract.*

10.5–253 551.521.64:551.590.21

Venkatesan, D., **Changes in amplitude of the 27-day variation in cosmic ray intensity during the solar cycle of activity.** *Tellus*, Stockholm, 10(1):117–125, Feb. **1958.** 9 figs., table, 13 refs. **DWB, DLC**—The 27-day recurrence tendency in the cosmic ray intensity has been studied by the Chree method of analysis for the period 1937–55, using the ionization chamber records at Huancayo. The amplitude of the 27-day variation changes from year to year. The variation in the amplitude is in general agreement with the changes in solar activity as revealed by the sun-spot number only for the years 1937–46 and 1952–55. This is in agreement with the results of MEYER and SIMPSON for the same periods, obtained from a slightly different method of analysis. The correlation breaks down for the period 1946–52 and this is discussed in terms of possible changes in the electromagnetic conditions in the interplanetary space during the solar cycle. *Subject Headings:* **1. Cosmic ray periodicities 2. Solar effects on cosmic rays.**—*Author's abstract.*

10.5–254 551.521.64

Zhdanov, G. V. and Khaĭdarov, A. A., **Issledovanie pronikaiushcheĭ komponenty elektronno-iadernykh livneĭ metodom zapazdyvaiushchikh sovpadeniĭ s godoskopom.** [In-

vestigation of the penetrating component of electron-nuclear showers by the delayed coincidenc method in conjunction with a hodoscope.] *Zhurnal Eksperimental' noĭ i Teoreticheskoĭ Fizik* Moscow, 32(4):706–713, April **1957.** 4 figs., table, 7 refs. **DLC.** Transl. into English b M. J. Gibbons in *Soviet Physics JETP* (American Institute of Physics), N. Y., 5(4):583–589 Nov. **1957.** figs., etc. **DLC**—The distribution in range of slow mesons created by cosmi rays on lead and graphite nuclei at effective energies of the order of 5 Bev and higher has bee investigated by a method described in Ref. 1. Some peculiarities of secondary interaction of penetrating particles of electron-nuclear showers at the same energies are also examined *Subject Headings:* **1. Cosmic ray penetrating showers 2. Cosmic ray mesons 3. Cosmic ra measurement instruments.**—*Trans. of authors' abstract.*

10.5–255 551.521.67:551.590.2

Kopecký, M., **Emise sluneční aktivity.** [Emission during solar activity.] *Meteor logické Zprávy*, Prague, 10(5):132–133, **1957.** fig., ref. **DWB**—The purpose of this note is provide some quantitative data on the various types of radiation emitted by the active su While doing this, the author realizes that the data available lack definite reliability, and most cases are only speculative. The types of solar emission discussed include ultraviol radiation, hard and soft X-rays, radio frequency radiation, and various types of corpuscul radiation. *Subject Headings:* **1. Corpuscular radiation 2. Solar activity 3. Radio frequen radiation 4. Ultraviolet radiation.**—*G.T.*

10.5–256 621.396.8:551.521.9:551.594.

Hartz, T. R., **Auroral radiation at 500 Mc.** *Canadian Journal of Physics*, Ottawa, 36(6 677–682, June **1958.** 2 figs., 14 refs. **DWB, DLC**—An observation of radio noise emissio at 500 Mc, from a type A red auroral display which occurred on Oct. 21–22, 1957, is reporte The circumstances surrounding this phenomenon are considered, and the unusual display linked to a large flare on the sun some 30 hrs earlier. It is concluded that an unusually lar particle flux for the ejected solar matter would produce sufficient ionization in local regions the ionosphere so that auroral radio emissions would be possible. *Subject Headings:* **1. Auron radiations 2. Radio noise.**—*Author's abstract.*

TEMPERATURE

See also: **Historic temp. records, Germantown, Pa.** (Havens), 10.5–86; **Sales met., N. Y. C.** (McGuire), 10.5–146; **Racial differences in heat tolerance** (Baker), 10.5–157; **Heat waves, Europe** (Koppány), 10.5–184; **Forecast. temp. anomalies** (Musaelian), 10.5–188; **Snow density and cover thickness** (Gold), 10.5–307.

10.5–257 551.501:551.5

†Mitchell, J. Murray, Jr. (*Office of Climatology, U. S. W. B.*), **Effect of changing observati time on mean temperature.** *American Meteorological Society, Bulletin*, 39(2):83–89, Fe **1958.** 4 figs., 4 tables, 13 refs., 7 eqs. **DWB, DLC**—Some of the literature dealing with t systematic bias in mean temperature, derived from daily maxima and minima resulting fr differences in observation time, is discussed. In this paper the author examines "the eff of arbitrarily small changes in observation time at a single station on the homogeneity of climatological temperature records." The effect of observation time on the mean temperatu as computed from the 24 h maximum and minimum values, was determined for eight fir order stations in the U. S. The procedure is expressed by the formula

$$\Delta T_h = \tfrac{1}{2}(M_h - M_{h_0} + m_h + m_{h_0})$$

h=0030, 0130 . . . 2330 (hrs LST), where the M's and m's are daily maximum and minim temperatures, respectively. The average value of ΔT_h for each observation time h and calen month μ is

$$\overline{\Delta T}(\mu,h) = \frac{1}{n(N-1)} \sum_{j=1}^{n} \sum_{i=1}^{N-1} (\Delta T_h)_{ij},$$

n=number of specific months and N=number of days in each month. The greatest te perature difference D at each station and month was found to be highly correlated with

ıean daily temperature range R, with the mean cloudiness C and with the mean interdiurnal :mperature, $D'=0.05\ R\ (C+0.30\ I)$, where R and I are in degrees F and C on a scale from to 1. An estimate of the influence of d on any specified shift Δh of observation time is btained by

$$d = D\Delta h/(15-h_s),$$

here h_s—time of sunrise in hours after midnight. An equation for determining I is presented.)ata are given on the effect of change—from morning to afternoon observations, effect of one- our change in time of morning observation and of one-hour change in afternoon observations, tc. and changes in time of temperature observations as illustrating a hypothetical station istory for Philadelphia. *Subject Headings:* **1. Homogeneity 2. Mean temperature calcula- ons.**—*I.L.D.*

10.5–258 551.508.29:551.524 551.525.4

Rohsenow, Warren M.; Clark, John A. and Van Alstyne, Paul C., **Analysis of errors in round and air temperature measurements.** *U. S. Corps of Engineers. Frost Investigations, iscal Year 1954*, [*Report*], October **1954.** 43 p. 29 figs., 11 refs., eqs. **DWB** (M24 U581a) -This report is a discussion of various thermal errors associated with the measurement of round and air temperatures. Errors associated with the digging of a pit and plunging tem- erature measuring devices into the ground through the side walls are considered. The effect f electric currents in resistance thermometers and in thermistors and the effect of radiation enetration in the ground are discussed. The types of errors associated with a long vertically ıstalled temperature sensing unit are mentioned. Steady-state and transient errors associated ith air temperature measurement under various conditions are presented. *Subject Headings:* **. Temperature measurement errors 2. Temperature measurement 3. Soil temperature ieasurement techniques 4. Temperature instruments. I. U. S. Corps of Engineers. Arctic onstruction and Frost Effects Laboratory, Boston.**—*Authors' abstract.*

10.5–259 551.524.1:551.588.1/2(52)

Mano, H., **Sudden increase of nocturnal temperature in valleys or basins.** *Journal of Meteorological Research*, Tokyo, 5(6):525–545, July **1953.** 31 figs., 8 tables, 18 refs. In apanese; English summary p. 525. **DWB**—Micrometeorological temperature, wind and umidity measurements made in various types of valleys and basins on Setonaikai Island are resented and discussed. The measurements were made in 1948–1950 at ground level and up) 300 m. The analysis of data reveals mechanisms of circulation and corresponding tem- erature variations, resulting from combined land-and-sea-breeze and mountain-valley-wind ffects. *Subject Headings:* **1. Nocturnal temperature rise 2. Land and sea breezes 3. Moun- ain and valley winds 4. Setonaikai Island, Japan.**—*G.T.*

10.5–260 551.524.3(43)

*Alfuth, W., **Eine Studie über die Temperaturverhältnisse in Frankfurt am Main und Hamburg.** [Study of temperature conditions at Frankfurt a.M. and at Hamburg.] *Frank- urt a.M. Universität. Meteorologisch-Geophysikalisches Institut, Bericht*, No. 6:13–17, **1956.** tables, 5 refs. **DWB** (M055 P578b)—The atmospheric temperature conditions at Frankfurt M. and at Hamburg are investigated as representative of the atmospheric temperature condi- ons characteristic of S.W. and N.W. Germany, respectively. Mean temperatures for the ieteorological season and mean square deviations for each season were computed. A sta- stical analysis of the temperature conditions shows that Frankfurt a.M. and Hamburg are tuated in different climatic regions. While there is no statistically significant difference in inter-temperatures, the temperatures of the other seasons are higher in Frankfurt than in Hamburg. Hamburg has a moderate oceanic climate with rather cool but variable spring, redominantly cool summers, relatively mild fall and variable winters; Frankfurt has a climate hat alternates between maritime and continental influences on the one hand and subtropical nd subpolar influences on the other. The winter temperatures vary considerably from year o year; the long period means of spring and fall are similar and the summer weather can be ther maritime cool or continental warm. The means of standard deviation of air tem- erature at these cities, comparisons of seasonal means at these cities and intergroup scatter

of mean seasonal air temperatures are given in tables. *Subject Headings:* **1. Temperatur regime 2. Frankfurt a.M., Germany 3. Hamburg, Germany.**—*I.L.D.*

10.5–261 551.524.3:551.526.8(439.

Juhász, József, **A Tisza és a Kőrősök vízhőmérsékletének összefüggése a léghőmérsék lettel.** [Relation between the temperature of the Tisza and Körös Rivers and air tempera ture.] *Hidrológiai Közlöny*, Budapest, 37(4):330–335, **1957.** 6 figs., table, 5 eqs. Germa and English summaries p. 334–335. **DWB**—Information on stream temperature is ofte indispensable. Such data, however, are often defective or available for a short period onl In order to complete short or incomplete water temperature records with the aid of existin air temperature data of longer periods, a correlation between them has been sought. N direct correlation between air and water temperature could be established. Neverthele a fairly definite graphical relation between the variations of the mean pentad air temperatu and the pentad water temperature could be found. An equation expressing this relation developed. For its successful application both air and water temperatures should be know for a period of at least 5 consecutive days. In default of this, some winter period should b examined, where water temperature can be assumed as zero. The method is applied to th Tokaj section of the Tisza river with fairly good agreement between measured and compute values. *Subject Headings:* **1. River temperatures 2. Air-river temperature relationshi 3. Hungary.**—*From author's abstract.*

10.5–262 551.524.31:551.588.7(7

†*Einarsson, E. and Lowe, A. B., **A study of horizontal temperature variations in the Winn peg area on nights favoring radiational cooling.** *Canada. Meteorological Div., CIR-264* TEC-214, April 22, **1955.** 19 p. 4 figs., 4 photos, 2 tables, 21 refs. **DWB, DLC**—Durin Feb.–Nov. 1952, sixteen traverses of the horizontal temperature field in Winnipeg, with a automobile-mounted resistance thermometer on nights favoring radiational cooling are an lyzed. The center of the city is found to act as a "heat island" with temperature differenc as great as 22.5°F being observed between the city center and open country. The effect various factors such as wind, cloud cover, vegetation, soil type and terrain are noted. *Subj Headings:* **1. Urban climatology 2. Urban temperature variations 3. Mobile temperatu surveys 4. Winnipeg, Manitoba.**—*Authors' abstract.*

10.5–263 551.524.31(43

Quitt, Evžen (*Brno Univ.*), **Příspěvek k metodice výzkumu teplotních poměrů mě** [Contribution to the methodology of research on urban thermal conditions.] *Meteorologic Zprávy*, Prague, 9(3):69–74, June **1956.** 5 figs., 29 refs. Russian and German summari p. 69–70. **DWB**—Temperature measurements were made in the city of Brno from Mar to Sept. 1955 with thermometers mounted on street cars. 7265 readings were obtaine covering various weather types and various times of the day and night. The method measurement is discussed in detail and sample data are graphically presented (sections of t relief along a route, with superposed temperature graphs and indication of the time of sta and finish of the trip). As a result of an analysis of the data the effect of various facto (building density, parks, narrow streets, rivers) on temperature conditions at various times the day both on clear and on cloudy days is discussed. Temperature differences up to 5.5 were observed between city and open country locations in the evening. Microclimatic effe are considerable on clear days but not clearly discernible on cloudy days. *Subject Headin* **1. Urban temperatures 2. Diurnal temperature variations 3. Temperature comparis 4. Brno, Czechoslovakia.**—*G.T.*

10.5–264 551.524.32(497

Malovčak, P., **Zime u Osijeku od 1900/01 do 1955/56 godine i njihova klasifikacija pre temperaturnim podacima.** [Winters at Osijek from 1900/01 to 1955/56 and their classificati according to temperature data.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 5(1/2):4 49, Jan./June **1956.** fig., table. Also his **Zime u Crikvenici. . . .** *Ibid.*, 6(1/2):80– Jan./June **1957.** 2 figs., 5 tables. **DWB**—Average temperatures for the winter season a for each winter month are graphically presented for Osijek and Crikvenica for a 55-yr peri

Winter temperatures during this period appear to show a normal distribution with no occurrence of extremely abnormal cold or warm winters. The second paper includes comparative tables for the two places. *Subject Headings:* **1. Winter temperatures 2. Osijek, Yugoslavia 3. Crikvenica, Yugoslavia.**—*G.T.*

10.5–265 551.524.32:551.513.7(73)

§O'Connor, James F. (*U. S. W. B., Wash., D. C.*), **The weather and circulation of June 1958: record cold in Northeast and warmth in Northwest.** *Monthly Weather Review*, Wash., D. C., 86(6):229–236, June **1958.** 5 figs., 7 refs. **DWB, DLC**—Some of the important weather highlights of June 1958 over the U. S. were record-breaking cool conditions in many parts of the Northeast, particularly southern New England; heavy rains and floods in the Wabash Basin of Indiana; flooding rains associated with the first tropical storm of the season in southern Texas: severe tornado activity in the central and north-central States, particularly Wisconsin; and a record-breaking cool snap late in the month with the lowest June temperatures on record at many Texas locations. *Subject Headings:* **1. Cool summer, 1958 2. Atmospheric circulation anomalies 3. United States.**—*Author's abstract.*

UPPER AIR TEMPERATURES

See: **Stratospheric temps., Antarctica** (Bannon), 10.5–63; **Thermosphere and satellite obs.** (Nicolet), 10.5–199; **Heat absorption by stratospheric dust** (Kalitin), 10.5–205.

SOIL TEMPERATURE

See: **Temp. measurement errors** (Rohsenow et al.), 10.5–258.

WATER TEMPERATURE

See: **Solar radiation absorption and effects on sea temperatures** (Boguslavskiĭ), 10.5–250; **River temp. and air-river temp. relationships, Hungary** (Juhász), 10.5–261.

PRESSURE AND WIND

PRESSURE

See also: **Diurnal and upper-air pressure variations** (Schwarzl), 10.5–268; **Monthly mean geostrophic winds** (Klein), 10.5–279.

10.5–266 551.54:551.509.33

Okamoto, M., **A comparison of timely mean and spatial mean of 5-day mean pressure.** *Journal of Meteorological Research*, Tokyo, 8(12):782–785, Jan. **1957.** 5 figs., 2 refs., eqs. In Japanese. **DWB, DLC**—Imaginary concentric circles of radius of 550 km, 890 km, 1750 km, and 2520 km from the center point at 35°N, 140°E with 12 equally distributed observation points on each circle are used for studies of time and space means from five-day mean pressure data from June 30–Dec. 21, 1955. Evaluations of equations with various conditions are discussed and illustrated with graphs. Space mean, expressing given horizontal distribution within a circle of radius of 1000–1500 km for averaging period (period required to reach average pressure) of 5 five-days (25 days), can be estimated as equal to time mean. *Subject Heading:* **Mean pressure charts.**—*J. Woo.*

10.5–267 532.5:551.541

Manson, Numa, **Une nouvelle relation de la théorie hydrodynamique des ondes explosives.** [A new relation of the hydrodynamic theory of explosive waves.] *Académie des Sciences, Paris, Comptes Rendus*, 246(20):2860–2862, May 19, **1958.** 2 figs., 13 eqs. **DLC**—Presentation of an analytic relation between the specific volume v_2 of the burnt gases in the Chapman-Jouguet state, the celerity D of the wave, partial derivatives of this celerity with regard to

two state variables of the blasting agent and its physical properties. *Subject Heading:* **1. Ex plosion waves.**—*A. V.*

10.5–268 551.543.1:551.547

Schwarzl, S., **Das tägliche atmosphärische Druckgeschehen gemässigter Breiten.** [Dail atmospheric pressure regime in middle latitudes.] *Archiv für Meteorologie, Geophysik un Bioklimatologie, Ser. A*, Vienna, 10(2/3):194–215, **1958.** 4 figs., 3 tables, 12 refs. Germa English and French summaries p. 194–195. **DWB, DLC**—The comparison of the diurna pressure variations at ground level and at the heights of the 500 mb, 225 mb and the 96 m surface shows certain regularities if sign and magnitude of the simultaneous temperatur processes of the lower half of the troposphere are taken into account. Characteristic inte relationships are found between these elements and geographical position and the season The interaction of pressure and temperature changes in the troposphere and stratosphe provides an insight into the general pressure phenomenon of the temperature latitudes. Th result does not correspond to hitherto prevailing conceptions on the origin and structure of th pressure processes. The short term (24 hrs) pressure variations comprise mostly the enti troposphere and lower stratosphere. The pressure impulses originate in high latitude, sta from the tropopause and proceed downwards and upwards. The particularly strong decreas of the interdiurnal pressure variability in the stratosphere leads to the assumption that th processes in strata above the 96 mb surface have no appreciable influence upon the pressu in the troposphere. Pressure processes of the lowest tropospheric strata can be accounte for by "high" pressure variations. Independent "low" pressures are of secondary importan although they sometimes occur. However, short term pressure variations of higher leve are not likely to build up from the ground. The sources of energy for these "high" pressu processes must be sought in the meridional circulation and in the very pronounced annu variations of the radiation in high latitudes and over the pole. *Subject Headings:* **1. Diurn pressure variations 2. Upper air pressure variations 3. Pressure variations.**—*Based author's abstract* [*I.L.D.*].

10.5–269 551.543.5:551.584.65:622.41:622

McIntosh, C. B. (*Dept. of Geography, Eastern Ill. State Col., Charleston*), **Atmospher conditions and explosions in coal mines.** *Geographical Review*, N. Y., 47(2):155–174, Ap **1957.** 10 figs., 6 refs. **DWB, DLC**—An analysis of the effect of daily and seasonal changes atmospheric conditions on the explosive compounds methane and cave dust, which are prese in coal mines and the possibility that such atmospheric changes produce conditions conduci to explosions. The author investigates the relationship between methane variations in co mines and changes in atmospheric pressure during various synoptic situations, seasonal vari tions and synoptic conditions (frontal passages) and moisture content of coal dust, weath conditions, in particular atmospheric pressure and atmospheric water vapor content associat with 364 explosions for explosive week of twelve periods (three days before the explosio the explosion day and three days after the explosion constitute an explosion week), the ph nomenon of series of explosion, i.e., the occurrence of disastrous explosions on the same da or of one on each of two successive days, and the relation of frontal passages to coal mi explosions. Extensive data are presented in graphs. *Subject Headings:* **1. Coal mine a mospheres 2. Explosions in coal mines 3. Pressure effects on coal mine air.**—*I.L.D.*

WIND

See: **Point discharge-potential gradient-wind speed relationships** (Chalmers), 10.5–338.

GUSTINESS AND TURBULENCE

See also: **Eddy diffusivity** (Kawano), 10.5–221; **Turbulence spectrum** (Panofsky et al.), 10.5–226.

10.5–270 551.551.5:551.5

Clem, LeRoy H., **Clear-air turbulence from 25,000 to 45,000 feet over the United State** *U. S. Air Weather Service, Technical Report*, No. 105–147, July **1957.** 13 p. 5 figs., 2 table

refs. **DWB** (M055 U58a). Also his: **Clear air turbulence over the U. S.** *Aeronautical ngineering Review*, 16(11):63–68, Nov. **1957.** 4 figs., 2 tables, 3 refs. **DLC**—A summary results of clear air turbulence, mountain wave, jet stream and other high level turbulence ivestigations conducted during the Project Cloud Trail in 1955 by the U. S. A. F. and Air Veather Service all over the U. S. including tabular data, schematic and frequency diagrams. onclusion is that some of the worst features of clear air turbulence can be avoided by forecast-ig probability of occurrence connected with specific synoptic conditions. *Subject Headings:* **Clear air turbulence 2. Jet stream turbulence 3. Project Cloud Trail 4. United States.** *–M.R.*

10.5–271 551.551.5:629.13

Pinus, N. Z., **K voprosu ob otsenke atmosfernoĭ turbulentnosti po intensivnosti boltanki korostnykh samoletov.** [The problem of estimating atmospheric turbulence by the intensity f bumpiness of fast airplanes.] *Meteorologiia i Gidrologiia*, No. 10:33–37, Oct. **1956.** 6 figs., tables, 5 refs. **DWB, DLC.** Trans. into English available at the National Research Council, ibrary, Ottawa 2, Canada as its 2319. Available for ref. **DWB** (S33.6 P647on)—The roblem of airplane bumpiness in the case of moderately fast airplanes is discussed and the cale for estimating atmospheric turbulence is presented. This is followed by a discussion of ne relationship between bumpiness of fast airplanes in atmospheres of varying degrees of urbulence, in chaotic turbulence, turbulence in stream flow, corkscrew vortices, turbulence n long wave disturbances, etc. A scale for estimating intensity of bumpiness of high speed irplanes is presented. *Subject Headings:* **1. Bumpiness 2. Atmospheric turbulence 3. Tur-ulence estimation.**—*I.L.D.*

10.5–272 551.551.5

†Press, Harry, **Atmospheric turbulence environment with special reference to continuous urbulence.** *North Atlantic Treaty Organization. Advisory Group for Aeronautical Research nd Development, Report*, No. 115, **1957.** 29 p. 12 figs., 31 refs., eqs. **DWB** (629.1308 N864r)—The flight-test techniques for measuring continuous atmospheric turbulence are riefly outlined and available measurements of the power spectrum of atmospheric turbulence eviewed. The measured results are examined in order to determine how well they approxi-nate the idealized models of a stationary Gaussian random process and of isotropic turbulence. inally, some recent results on the variation with altitude of the probability distribution of the oot-mean-square gust velocity are presented and the application of these results to operational esponse history calculations indicated. *Subject Headings:* **1. Continuous atmospheric tur-ulence 2. Turbulence spectrum.**—*Author's abstract.*

10.5–273 551.551.8

Wilkins, Eugene M. (*U. S. Weather Bureau*), **Computation of instantaneous source iffusion coefficients from smoke puff observations.** *Journal of Meteorology*, Boston, 15(2): 75–179, April **1958.** 3 figs., table, 8 refs., 10 eqs. **DWB, DLC**—A method is proposed whereby the Sutton-type diffusion coefficients appropriate for the instantaneous source may e estimated from observations of dissipation times for smoke puffs generated by standard gun-owder charges. It is logical to base the determination of these coefficients on observations f the spreading of smoke, especially if the technique is simple, inexpensive and subject to tandardization. *Subject Headings:* **1. Diffusion coefficients 2. Smoke puff diffusion ex-eriments.**—*Author's abstract.*

WIND DISTRIBUTION AND WIND VARIATIONS

See also: **Wind conditions over reservoirs, Don Volga Basin** (Anapol'skaia), 10.5–21; **Sea breeze hodographs, Halifax, N. S.** (Dexter), 10.5–162.

10.5–274 551.553.6:551.501.45

Court, Arnold, **Wind correlation and regression.** Cooperative Research Foundation, Golden Gate Park, S. Francisco, Contract AF 19(604)-2060, Scientific Report, No. 3, Feb. 19, 1958. 16 p. 9 refs., eqs. **DWB** (M58 C778s)—Correlations between vectors representing

winds at different heights, places, or times, are discussed in detail. The logical extension of t simple bivariate correlation coefficient to the multiple correlation coefficient is carried o step further to define the vector correlation coefficient, in terms of the ratio of conditional a unconditional variances. This coefficient is compared with those previously proposed a currently used, in particular the coefficients of "stretch" and "turn" which are based on assumed constant angular difference between the two vectors. *Subject Headings:* **1. Regressi equations 2. Wind correlation calculation 3. Vector correlation coefficient.**—*Autho abstract.*

VERTICAL DISTRIBUTION AND SPECIAL WINDS

See also: **Sea surface evaporation at "Tango"** (Ogata et al.), 10.5–101; **Sukhovei effects agric.** (Tsuberbiller), 10.5–304.

10.5–275 551.555.6:551.556:551.578.

*Grishin, I. S., **Vliianie meteleĭ na akkumuliatsiiu snega v ovrazhnobalochnoĭ seti basseĭ r. Dona.** [The influence of blizzards on snow accumulation in the gullies and ravines of t Don River Basin.] *Meteorologiia i Gidrologiia*, Leningrad, No. 5:37–40, May **1957.** fi 2 tables, 6 refs. **DWB**—In open steppe country the distribution of snow cover depends the character of the erosional dissection of water basins and the wind regime. The transpo of snow by blizzards and its accumulation in gullies and ravines depend primarily upon t density of the gully-ravine network and the intensity of the blizzards. Over the gully-ravi area, which constitutes 5.5% of the entire Don River Basin, the average accumulation snow for 4 yrs amounted to 15.5% relative to the water resources of the basin, with variatic from 11.0% to 21.1% during individual years. The accumulation of snow in the gully-ravi area amounts to an average of 9.5%. Numerical data are presented in tables. *Subj Headings:* **1. Transport of snow by blizzards 2. Snow accumulation in gully-ravine are 3. Don River Basin, U.S.S.R.**—*I.L.D.*

10.5–276 551.555.9:551.558.21(5

Akiyama, T., **On the occurrence of the local severe wind "Yamaji," Pt. 2.** *Journal Meteorological Research*, Tokyo, 8(10):627–639, Nov. **1957.** 17 figs. In Japanese; Engli summary p. 627. **DWB, DLC**—In his previous paper, the author made an analysis of t local severe wind "Yamaji" which occurs in the eastern part of Ehime Prefecture. The fi part of the present paper describes the statistical characters of Yamaji wind, using three yea of data (1952, 1953, 1954) from the Toyooka, Kofuji, Kanada, Shohaku and Tomisato statio The results are as follows: 1) Yamaji wind occurs most in April, May and June, though so of them occur in Feb. March, Sept. and Oct. Violent Yamaji wind that often causes hea damage occurs in spring and autumn. Its maximum velocity is usually 5–15 m/s, and it expected that Yamaji wind with maximum velocity exceeding 15 m/s occurs 2–5 times in year. Yamaji wind is associated with a remarkable föhn phenomenon, and the föhn is m remarkable in cold season. 2) Most of Yamaji wind occurs in the afternoon, and shows pronounced diurnal change in the frequency of occurrence. It occurs most frequently 06 h and 21 h, most rarely at 03 h and 10 h. A violent Yamaji gives rapid fluctuations on t barograph. The period of the fluctuation is 2–5 min, and the amplitude 1–3 mm Hg. Whe Yamaji is blowing, the pressure in the Uma District shows lower values than those in t neighborhood. 3) For the most part, a violent Yamaji occurs when a cyclone passes throu the area between the central part of Korea and the central part of East China Sea. An violent Yamaji is apt to occur when the pressure gradient in the Uma District has a direct from ESE–SSE to WNW–NNW. When the southern component of wind velocity o Yonago exceeds 10 m/s at the 100-m level, and when it exceeds 20 m/s, violent Yamaji wi are apt to occur. In the latter part of this report, the streamlines of a Yamaji wind wh occurred in 1954 are shown. Features of a violent Yamaji-wind which occurs when a typh approaches are much different from those of a common Yamaji which occurs when a cyclo passes. In both types, there are convergence and divergence areas over the Uma plain wh a Yamaji is blowing, and so it seems possible to suppose that a lee wave or lee vortex exis (For Pt. 1, *see* 6.11-260, Nov. 1955, *MAB.*) *Subject Headings:* **1. Yamaji wind 2. Lee wa 3. Japan.**—*Author's abstract.*

10.5–277 551.555.9(47)

*Gal'tsov, A. P., **O meteorologicheskikh kriteriiakh sukhoveia i stepeni ikh dostovernosti.** Meteorological criteria of dry winds and their degree of validity.] (In: Akademiia Nauk SR. Institut Geografii, **Sukhovei ikh proiskhozhdenie i bor'ba s nimi.** Moscow, **1957.** . 81–93. 7 figs., 11 refs., 2 eqs.) **DLC** (QC940.R9A6)—The author presents some results f his comparison of observations of the condition of plants and meteorological data made at 8 tations of the Hydrometeorological Service of southeastern European U.S.S.R. during 7 egetation periods from May to Aug. 1946–1952. The comparison was made in order to etermine the correctness of various meteorological criteria of dry-wind (sukhovei) weather. *ubject Headings:* **1. Sukhovei effects 2. Southeast European U.S.S.R.**—*A.M.P.*

10.5–278 551.555.9:581.1

Kulik, M. S., **Kriterii sukhoveev.** [Criteria of dry winds.] (In: Akademiia Nauk SSR. Institut Geografii, **Sukhovei ikh proiskhozhdenie i bor'ba s nimi.** Moscow, **1957.** . 65–70. 7 refs.) **DLC** (QC940.R9A6)—A detailed study of the problem of dry winds and heir effect on plants during the vegetative period are summarized as follows: saturation eficiency of the air reaching 17 mm, or more, with wind speed of more than 5 m per second s the symptom of dry wind ("Sukhovei") weather. The evaluation of dry wind weather equires the strict consideration of: 1) the dynamics of soil moisture; 2) the preceding condi- ions that affected the immunization of the plant against dryness; and 3) the condition and hases of plant development. *Subject Headings:* **1. Sukhovei effects on plants 2. Plant ryness.**—*A.M.P.*

WIND EFFECTS

See: **Hurricane damage and forest management** (Jones), 10.5–126; **Transport of snow by blizzards, Don River Basin** (Grishin), 10.5–275.

UPPER AIR WINDS

See also: **Trajectographs** (Nania), 10.5–163.

10.5–279 551.557:551.542.1(73)

Klein, William H. (*U. S. W. B.*), **Comparison of monthly mean geostrophic and resultant wind speeds.** *Monthly Weather Review*, Wash., D. C., 85(11):364–366, Nov. **1957.** 2 figs., able, 7 refs. **DWB**—A cartographic comparison of mean 200-mb geostrophic wind speeds nd resultant 200 mb wind speeds for June 1957 for the U. S. shows fairly good agreement. The jet stream, as located on the monthly geostrophic charts, is somewhat weakened due to smoothing in the original analysis in obtaining monthly means, and in the determination of winds from geopotential contours, but is still plainly evident as it shifts north in the spring (April–June). These "mean" jet stream locations are useful in comparative studies of weather nd circulation over a series of months or years, even though they are not exactly the mean of ll the daily jet stream positions or speeds. *Subject Headings:* **1. Monthly mean geostrophic winds 2. Resultant wind charts 3. 200 mb jet stream 4. United States.**—*M.R.*

10.5–280 551.557.3:623.5

*Arnold, A. and Bellucci, R., **Variability of ballistic meteorological parameters.** *U. S. Signal Engineering Labs., Ft. Monmouth, Technical Memorandum*, M-1913, Aug. 30, **1957.** 27 p.+90 p. of appendices. figs., tables, eqs. **DWB** (M:623.5 A752v)—A summary and nalysis of data obtained during previous projects in the U. S. and the U. K. with a view owards determining the variability of upper wind, temp. and density with time or space, eglecting the instrumental errors. The major part of this report is concerned with variability f ballistic winds as measured with balloons. The mathematics or statistics are discussed, 'scale" and variability, the role of instrumental error, independence of data, sources of data, actors affecting variability: 1) altitude, 2) wind speed, 3) geography and season, 4) meteoro- ogical conditions. Finally, the design of an artillery meteorological observation system is onsidered. *Subject Headings:* **1. Ballistic wind variability 2. Upper air wind variability.** —*M.R.*

VERTICAL MOTION

See also: **Potential temp. field of typhoons** (Masui), 10.5–236; **Yamaji wind and lee waves, Japan** (Akiyama), 10.5–276.

10.5–281 519.24:551.5

Charnock, H. (*Natl. Inst. of Oceanog.*) and Robinson, G. D. (*Kew Obs.*), **Spectral estimate from subdivided meteorological series.** *Great Britain. Meteorological Research Committe M.R.P.*, 1062, Aug. 27, **1957.** 6 p. 6 figs., 16 refs., 13 eqs. **DWB** (M(055) G786m)—Th relation $\frac{1\partial^2}{2\partial s^2}(s^2\Phi(s)) = 1 - R_+(s)$ between $\Phi(s)$, the average fraction of the covariance contain in subseries of s terms, and $R_+(s)$, the even part of the cross-correlogram, is simply derive Its use and practical limitations are illustrated by the analysis of an artificial series. Th form $\Phi(s) = s/(a+s)$ appears to be a suitable approximation for certain series involving vertic wind near the ground. The corresponding spectrum is discussed. *Subject Headings:* **1. Sta tistical spectra 2. Vertical wind analysis.**—*Authors' abstract.*

10.5–282 551.558.1:551.511.6(234.

*†Reshetnikova, K. A., **Opredelenie vertikal'nykh tokov iz uravnenii dinamiki turbulentn atmosfery i analiz ikh srednemesiachnykh znachenii.** [Determination of vertical curren from equations of the dynamics of atmospheric turbulence and analysis of their mean month values.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, No. 71:72–93, **195** 4 figs., 7 tables, 49 refs., 45 eqs. **DWB** (M(055) U581tG)—In this analysis of the facto producing vertical atmospheric currents in a turbulent atmosphere, special attention is giv to the role of surface irregularities in addition to those of unstable motion, vertical turbule exchange and variations of the Coriolis parameter. The contents of this theoretical stu include the following: a mathematical discussion of a nonstationary model of the distributi of wind velocity in the layer of the atmosphere near the ground (relief of the locality bei taken into account); vertical constituent of wind velocity in the lower atmospheric lay (both turbulent friction and surface relief being considered); a method for calculating vertic velocities; the results of calculations of the field of mean vertical velocities in the Northe Hemisphere; and stochastic relationship of the vertical movements in the atmosphere wi the processes of heat and moisture exchange. Maps showing orographic vertical curren over the Urals in Jan. and mean vertical velocities over uneven relief in Jan. and July, a numerical data on the vertical component of wind velocity at the 1500 m level in Jan. a July, the total heat advection, vertical transport, and turbulent horizontal exchange at t 1500 m level in Jan. and July are presented. *Subject Headings:* **1. Vertical currents 2. Verti turbulent exchange 3. Vertical velocities 4. Ural Mountains.**—*I.L.D.*

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

EVAPORATION AND EVAPOTRANSPIRATION

See also: **Wind velocity distrib., "Tango"** (Ogata et al.), 10.5–101; **Air mass transformation and evapor. theory** (Tseĭtin), 10.5–227; **Drought periods and potential evapotranspiration, Fukuoka, Japan** (Kusakabe), 10.5–303.

10.5–283 551.573:061.6 551.5

†Davis, John R. (*Purdue Univ., Lafayette, Ind.*), **Evaporation and evapotranspirati research in the United States and other countries.** Presented as a contribution of the Evap transpiration Committee, Hydrology Group, American Society of Agricultural Engine Dec. **1956.** 87 p.—A state-by-state listing of all of the known projects (226) relating to s moisture and evapotranspiration in the U. S. (and Canada, England, Holland, Denma Philippines, Puerto Rico, etc.). A subject index gives an idea of the range of crops and subje being studied along these lines. In each case the institution, chief investigators, type

oject, objectives of study and publication (if any) in which the work was reported, is in-cated. Regional and governmental projects, as well as those sponsored by local or state stitutions, are also listed. *Subject Headings:* **1. Evapotranspiration research projects Agricultural meteorology 3. United States.**—*M.R.*

10.5–284 551.573:551.579:551.491

Gardner, W. R. and Fireman, Milton (*both, U. S. Dept. of Agri.*), **Laboratory studies of aporation from soil columns in the presence of a water table.** *Soil Science*, Baltimore, (5):244–249, May **1958.** 7 figs., 8 refs., 5 eqs. **DLC**—The experimental rates of evaporation water from laboratory soil columns have been compared with the theoretical solutions of the eady-state unsaturated moisture-flow equation. Good agreement between theory and periment was found. The evaporation rate is determined by climatic factors which control e external potential evaporation or by the maximum rate of upward movement of water in e soil, whichever is the lesser. The evaporation rate is shown to be inversely proportional the thickness of a surface mulch when the rate of vapor movement through the mulch is ss than the potential evaporation. *Subject Headings:* **1. Evaporation from soil 2. Water ble.**—*Authors' abstract.*

10.5–285 551.573:547.26

Grundy, F., **Cetyl alcohol reduces evaporation from reservoirs.** *World Meteorological rganization, WMO Bulletin*, 7(2):64–67, April **1958.** 2 figs., 4 refs. **DWB.** Review in *ature*, London, 182(4634):500, Aug. 23, **1958.**—Trials of evaporation reduction by use of tyl alcohol flakes on the surface of pans in East Africa are described and illustrated. In id regions as much as 250,000 gal of water may be lost in a year from one acre of water surface, id 2 drought years is catastrophic. Water use may be only a fraction of evaporative loss. ork was begun in 1953 in Australia (CSIRO) and in 1954 by D. A. Davies in East Africa here a 60% reduction was achieved in the first trials. Flakes and pellets in small gauge rafts ere later used on reservoirs near Nairobi and in Tanganyika. Finally, a solution of cetyl cohol in kerosene, applied continuously from dispensers on the bank at the upwind end, in a steady stream from a moving boat if wind is changeable, was found effective. Con-olled experiments have shown a 30% reduction from small reservoirs and an 11% reduction om large windy ones. *Subject Headings:* **1. Evaporation reduction from reservoirs 2. Cetyl cohol 3. East Africa.**—*M.R.*

10.5–286 551.573:581.11

King, K. M. (*Ontario Agr. Coll., Guelph, Ont.*), **Effects of soil, plant and meteorological ctors on evapotranspiration.** *Royal Meteorological Society. Canadian Branch*, [*Publication*], (4), Nov. 28, **1957.** 10 p. 3 figs., 16 refs. **DWB**—A general discussion of the heat and ater budget of crops (evapotranspiration, soil, plant and meteorological factors affecting ops). The supply of heat at the evaporating surface and the availability of water at the aporating surface are the two main factors influencing evapotranspiration. The heat and oisture budget of a crop-soil-air system is shown on a schematic diagram, and 2 nomograms ow (1) relation of sensible heat flux to evapotranspiration from a cotton crop and (2) the ange with time of water stored in a soil with and without vegetative cover. *Subject Heading:* **Evapotranspiration.**—*M.R.*

CONDENSATION

See also: **Icing of aircraft** (Mazin), 10.5–26; **Aircraft accidents** (Lebon), 10.5–123.

10.5–287 551.574.11

†Sänger, R. (*E.T.H. Zurich*), **The mechanism of ice-forming nucleability.** *Puy de Dôme. bservatoire, Bulletin*, Ser. 2, No. 3:75–82, July/Sept. **1957.** 22 refs. French and English mmaries p. 75. **DWB**—Even though findings available today on the power of ice-forming icleation are sometimes contradictory, it is possible to derive certain reliable information om the experimental results. We must assume that the atoms in the surface of an active icleant show a geometric lay-out close to that of the oxygen atom lattice of the ice crystal. the threshold temperature is high, the nature of the binding forces must as far as possible

correspond to those of the ice lattice. Surfaces which are in a state of synthesis are not to deemed to possess a potential field structure favorable to ice-forming nucleability. Therefo we expect that active nucleants possess a very low degree of solubility, which is fully confirm by experimental observations. In the same way we may state that the hygroscopic natu of a substance impedes the display of its possible nucleability. In this connection we mu assume that already the first layer of adsorbed water molecules on the surface of an ice-formi nucleant becomes solidly embedded, whereas, in the case of hygroscopic substances, the a sorbed molecules continue to exhibit considerable mobility within their layer. Binary chemi compounds which are found to be active nucleants with a relatively high threshold temperatu possess marked polarity despite the homopolar character of their chemical bond. T peculiarity placed them in a category very similar to that of the semiconductor. The pow of ice-forming nucleation being essentially a surface property of the nucleant, we have to expe that chemisorption and adsorption processes are of a dominating importance. Nucleabili may be reduced and concealed by chemisorption just as it may also be cultivated and stim lated. *Subject Headings:* **1. Nucleation 2. Nuclei adsorption properties.**—*Author's abstrac*

10.5–288 551.574.12:551.594.

Godard, L. (*Obs. du Parc St-Maur*), **Sur l'utilisation des fluides de silicone pour la mesu des charges électriques individuelles portées par de fines gouttelettes.** [Utilization of silico fluids for the measurement of individual electrical charges carried by small drops.] *Puy Dôme. Observatoire, Bulletin*, Ser. 2, No. 3:83–93, July/Sept. **1957.** 4 figs., 6 refs., 8 e English and French summaries p. 83. **DWB**—This contribution shows some electrical p nomena at the surface of separation between water droplets and a silicone fluid. If we u proceedings of microscopic photography, we determine the sizes of droplets and their t jectories under the influence of an electrical field, in a condenser recipient. The experimen results show that the initially uncharged or weakly charged droplets take apparent charg proportional to their radii; these charges correspond to an electrokinetic potential wh depends on the chemical constitution of the droplet. We can think that the charges obtain by this proceeding come from the constitution of ionic atmosphere which is formed by orien tion of dipoles at each interface between silicone and droplet. *Subject Headings:* **1. Electri charges on drops 2. Silicone measurement of droplet charge.**—*Author's abstract.*

FOG

See also: **Fog statistics, Kurile Is.,** 10.5–25; **Fog forecasting** (Pollard), 10.5–187.

10.5–289 551.575.2(4

*†Osipova, G. I., **Osobennosti territorial'nogo i vremennogo raspredeleniia tumanov severo-zapade Evropeĭskoĭ territorii SSSR.** [Characteristics of spatial and temporal distribution in the northeastern European U.S.S.R.] *Leningrad. Glavnaia Geofizicheska Observatoriia, Trudy*, No. 71:209–228, **1957.** 8 figs., 6 tables, 40 refs. **DWB** (M(055) U581t —Using five years of observations (1946–1950) of second order stations of the North-weste Administration of the Hydrometeorological Service, the author investigated the influence local conditions upon the spatial and temporal distribution of different types of fogs, the pos bility of distinguishing the various types of fogs climatologically and the precise determinat of the number of days with fogs of various types. The contents of this study include following: a brief account of present knowledge on the spatial and temporal distribution fogs in the U.S.S.R.; the physical geographic characteristics of the Pskov and Novgor Oblasts which constitute the region studied; types of fogs observed in the northwestern p of the European U.S.S.R., namely, radiational and advective fogs; territorial distribution of number of days with radiational fog, annual variation and diurnal variation and duration of number of days with radiational fog; territorial distribution of the number of days with vective fog and annual and diurnal variations and duration of the number of days with vective fog; the synoptic conditions involving these simultaneous formations of radiatio and advective fogs, the transition of one type into another, and an exact climatological analy of the number of days with fogs. Data are presented in tables and graphs. *Subject Headin*

Fog distribution 2. Radiation fog 3. Advection fog 4. Synoptic conditions for fog Pskov Oblast, U.S.S.R. 6. Novgorod Oblast, U.S.S.R. —*I.L.D.*

10.5–290 551.575.36:551.515.4(494.4)

Bouët, Max, **L'orage et le brouillard à la Vallée de Joux.** [Thunderstorm and fog at allée de Joux.] *Société Vaudoise des Sciences Naturelles, Bulletin*, 66(295):433–439, Aug. 31, 57. fig., 3 tables, 10 refs. **DLC, DWB**—Discussion with data of 55 yrs of thunderstorm and g observations at Sentier, Vallée de Joux, in the Vaudois Jura of Switzerland including urnal, seasonal and year to year variations. Average number of days a year with thunder 36, with fog 41. Diurnal curve for Sentier is compared with that for Lausanne, where the aximum occurs at 20 h, instead of 17 h. *Subject Headings:* **1. Thunderstorm frequencies Fog frequencies 3. Sentier, Switzerland.**—*M.R.*

CLOUDS

See also: **Cloud and weather modification projects** (Petterssen et al.), 10.5–5; **Electrification of clouds** (Petrov), 10.5–331.

10.5–291 551.576.11:551.507.362

Pressman, J.; Marmo, F. F.; Aschenbrand, L. M.; Jursa, A. S. and Zelikoff, M., **Artificial ectron clouds.** *AGARDograph*, Paris, No. 26:39–41, July **1957. DWB** (629.1322 N864a)— he paper described an experiment to produce electron clouds artificially. This is achieved releasing NO from a rocket at a height of 95 km. The electrons are produced by ionization this gas by solar Lyman alpha radiation. The electron cloud formed acts as a reflector of ectromagnetic waves. The experiment was performed on March 22, 1956 at Holloman FB, New Mex. *Subject Heading:* **1. Artificial ion clouds (NO).**—*Authors' abstract.*

10.5–292 551.576.4:656.71

*Spreen, William C. and Solomon, Irving (*both, Hq., Air Weather Service, Directorate of lim.*), **An indirect method for estimating the frequencies of ceiling below various altitudes nd within various altitude ranges.** *American Meteorological Society, Bulletin*, 39(5):261–265, lay **1958.** 2 figs., 2 tables, ref. **DWB, DLC**—The solutions of many problems in applied imatology depend upon the further interpretation of available data through considerations theory and a logical manipulation of the data. This paper describes an example of such procedure whereby standard data summaries are arranged in logical manner for a solution the problem and, with further analysis based on background knowledge and theoretical oncepts, reasonable estimates of values of unobserved parameters are attained. *Subject leadings:* **1. Ceiling frequencies 2. Ceiling data.**—*Authors' abstract.*

PRECIPITATION

See also: **Hydrol. yearbooks, Israel,** 10.5–24; **Hist. of drought and conservation, U.S.S.R.** (Zavarina), 10.5–36; **Historic droughts, U.S.S.R.** (Buchinskiĭ), 10.5–82; **Cotton industry, Angola** (Queiroz), 10.5–150; **Excessive rainfall, Moscow** (Cherkasskaia), 10.5–179; **Forecast errors, Moscow** (Isaeva), 10.5–182; **Convective precip. and forecast errors** (Mertsslov), 10.5–186; **Convergence line-precip. rel.** (Peterson), 10.5–219; **Radar analysis of typhoon rainfall** (Ushijima), 10.5–238; **Typhoon precipitation distribution** (Liu, Tung), 10.5–239; **Flood damage, U. S. (1952–1955),** 10.5–312.

10.5–293 551.577.2(45)

*Mennella, Cristofaro, **Sulla attendibilità dei presunti valori normali delle precipitazioni Italia.** [On the reliability of presumed normal values of precipitation in Italy.] *Società eografica Italiana, Bollettino*, Ser. 8, 10(6/8):273–303, June/Aug. **1957.** numerous tables, refs. **DWB**—Rainfall records for Milan (1766–1951) and Rome (1786–1951) are analyzed y 5 yr periods to show the variability between the 37 pentads for winter, summer and annual recip., respectively. Monthly means and variability are also examined for the 2 stations nd extreme and mean annual values for 15 stations which have shorter records. Monthly nd annual variability by decades for 1931–1951 are then tabulated and discussed (also for

Perugia 1811–1951, Rome 1831–1951, Naples 1821–1951, etc.), then 30 yr periods are examin for the several stations with over 100 yrs of record. Finally, 40 and 60 yr means are compar month by month. Even the 60 yr means do not show much stability from one period another, owing to the absence of the highest values from one or the other of the periods— least where rainfall is extremely variable as it is in Italy. *Subject Headings:* **1. Precipitati normals 2. Rainfall variability 3. Long period precipitation records 4. Italy.**—*M.R.*

10.5–294 551.577.2:551.577.32(47

*Neronova, L. M., **Raspredelenie letnikh osadkov. v Moskovskoĭ oblasti.** [Distributi of summer precipitation in the Moscow region.] *Moscow. Tsentral'nyĭ Institut Prognoz Trudy*, No. 52:67–129, **1957.** 9 figs., 21 tables, 6 refs. **DLC**—This comprehensive study on t distribution of summer precipitation according to area and intensity in the Moscow distr is based on 5 years of rainfall data (1950–54) for the months of May–Aug. Out of 615 cas rain was observed in 486 cases (79%) during the day and 467 cases (76%) at night; in 1 cases (21%) during the day and in 148 cases (24%) at night rainfall was absent. The numb of cases with frontal and intramass rainfall is similar to the above. In the Moscow distr the intramass and frontal rainfall are distributed unequally. The mean monthly amount frontal rainfall is considerably greater than the sum of intramass rainfall. Intramass rainf is distributed as traces and most frequently includes a small number of stations. Front rainfall is observed usually by day and includes a large number of stations. If less than h of the stations include intramass and frontal precipitation the amount does not exceed mm/12 hrs; if they include more than half of the stations, then part of them records precipit tion exceeding 8 mm/12 hrs. Extensive numerical data on the characteristics of rainf incidence are presented in tables and an appendix. The complete statistical data upon whi the study is based, namely limiting values of 12 hour rainfall amounts (day and night) at t weather stations of Moscow district for different synoptic situations, mean amount of intrama and of frontal rainfall for each month during the period for each station are also presente *Subject Headings:* **1. Precipitation distribution 2. Summer precipitation 3. Moscow Regio U.S.S.R.**—*I.L.D.*

10.5–295 551.501:551.577.2

Schneider-Carius, K. (*Univ. Leipzig*), **Grundsätzliches zur Definition der Niederschlag höhe bei Niederschlagsmessungen im Gebirge.** [Concept of precipitation amount in pr cipitation measurements in mountains.] *La Météorologie*, Paris, Ser. 4, No. 45/46:111–11 Jan./June **1957.** German, French and English summaries p. 111. **DWB**—The distinctio between meteorological and hydrological precipitation is briefly discussed. The term "pr cipitation height" should be limited to the results of exclusively meteorological processes of t precipitation formation. It is of advantage to replace the term "hydrological" precipitati height by another terminology, for example "water use." In high mountains and pol latitudes, the determination of the exactly defined precipitation height is hardly ever successfu These precipitation measurements relate almost entirely to the determination of the "wat use." In each of these cases special considerations are required to draw from them conclusio as to the "precipitation height." *Subject Headings:* **1. Precipitation amount 2. Precipitati measurement in mountains.**—*Author's abstract.*

10.5–296 551.577.32:551.513(

Dao, Shih-yen (*Inst. of Geophysics and Met., Academia Sinica*), **The relationship betwe May-Yü in Far East and the behaviour of circulation over Asia.** *Acta Meteorologica Sini* Peking, 29(2):119–134, May **1958.** 8 figs., table, 22 refs. In Chinese; English summa p. 134. **DWB**—Using the climatological data and aerological reports of the years 1951–195 the author investigates the characteristics of climate of May-Yü (Bai-u) in Far East and i relation to the behavior of circulation over Asia. It is found that May-Yü occurs in t transitional period from spring to summer. The onset of May-Yü is associated with the ou burst of Indian monsoon. They are closely related with the dissolution of the jet strea to the south of the Himalayas. When the jet stream over Japan disappears and easter wind begins to appear, the May-Yü period terminates. The change takes place in the sa

nner each year. The results are helpful to prediction. *Subject Headings:* **1. Bai-u circulation 2. Circulation effects on Bai-u 3. Asia.**—*Author's abstract.*

10.5–297 551.577.34(41)

Glasspoole, J., **Recent seasonal trends in the number of rain-days over Great Britain.** *eteorological Magazine*, London, 86(1026):358–362, Dec. **1957.** 3 figs., 3 refs. **DWB**—asonal and annual curves of 10-yr moving averages of number of rainy days for England d Wales, and for Scotland (1881–1915 used as mean), show a steady decrease from 1930 to 50, followed by a small rise. Trends in number of rainy days and wet days are similar to ose for rainfall amount. Differences are brought out by series of curves of mean rain per in day or per wet day. The amount of rain per rain day has noticeably increased. The ring curve parallels that for temperature (increase of 2°F since 1922/31 in mean temperature, d 0.03″ in mean rain per rainy day). Some relation is shown between mean rain/rain day d sunshine during recent periods. Similar relations are shown for mean rain/wet day and nual numbers of wet days. *Subject Headings:* **1. Seasonal rainfall trends 2. Rainfall trends Great Britain.**—*M.R.*

10.5–298 551.577.36:551.577.37(282.272.72)

*U. S. Weather Bureau, **Rainfall intensity-frequency regime, Pt. 1, The Ohio Valley.** Its *echnical Paper*, No. 29, June **1957.** 44 p. figs., tables, 12 refs., eq. **DWB**—This report ne of a series of such regional reports) covers the rainfall intensity-frequency regime for the hio Valley. This research is intended to provide material for use in developing planning d design criteria for water shed protection and flood prevention programs. The content so covers the rainfall duration-area-frequency regime and other storm characteristics for the alley. The duration is from 20 min to 24 hrs and the area from point to 400 sq mi. Discussions, analyses, and interpretations of the influencing climatic factors in line with illustrative iagrams, charts and seasonal probabilities of rainfall and precipitation are included. (For milar report on Southwestern United States, *see* 10.3–11, March 1959, *MAB.*) *Subject eadings:* **1. Rainfall intensity-frequency regime 2. Ohio Valley.**—*N.N.*

10.5–299 551.577.37:551.515.4

Muchnik, V. M., **Sviaz' grozoobrazovaniia s intensivnost'iu osadkov.** [The relation of hunderstorm formation to precipitation intensity.] *Meteorologiia i Gidrologiia*, Leningrad, :31–33, **1957.** fig., 2 tables, ref. **DWB, DLC**—A knowledge of the intensity of rainfall ith and without thunderstorms would facilitate a more exact calculation of the formation r the rate of formation and accumulation of charges in thunderstorm clouds and computation f the probability of thunderstorm formation. A study of rainfall based upon a microclimatogical network of automatic rain recorders and simultaneous observations on showers with r without thunder was carried out. It was found that 61% of thunder showers have a ormal intensity greater than 0.60 mm/min, and only 5% have a maximum intensity up to .20 mm/min. The frequency of maximum rainfall intensity for downpours with near thunder distance from thunderclaps less than 3 km) indicates that 80% of the downpours with such lose thunder have a maximum intensity 10 times greater than those without thunder. A raph shows the relationship of maximum rainfall intensity and duration for downpours with nd without thunder. It indicates that rainfall with thunder has the shortest duration. *ubject Headings:* **1. Rainfall intensity-thunderstorm relationships 2. Rainfall duration ntensity-thunder relationships 3. Thunderstorms.**—*I.L.D.*

10.5–300 551.577.37:551.515.2(52)

Saga, Japan. Meteorological Observatory, **On the relation between rainfall and typhoon Saga Prefecture.** *Journal of Agricultural Meteorology*, Tokyo, 12(4):157–158, March **1957.** figs. In Japanese; English summary p. 158. **DWB**—The relation between the rainfall of arious districts and the typhoon is settled by the position and the track of typhoon. The ainfall of Mitsuse is nearly double that of Saga, as in Fig. 1, when the typhoon passes west r north of Saga. The rainfall of Mitsuse is about eleven times that of Saga, as in Fig. 2, hen the typhoon lands in the southern end of Kyushu and then progresses north-northastwards, or when the typhoon passes east of Miyazaki and then progresses northwards.

But the rainfall of Mitsuse is only three times that of Saga when the typhoon lands in southern end of Kyushu and then progresses northwards. *Subject Headings:* **1. Rainf typhoon relationships 2. Typhoon rainfall 3. Saga Prefecture, Japan.**—*Author's abstract.*

10.5–301 551.577.38(4

*Karapiperis, Leonidas, N., **La siccità osservata in Grecia nel mese di Febbraio 19** [Drought in Greece in Feb. 1957.] *Geofisica e Meteorologia*, Genoa, 5(3/4):48–50, May/A **1957.** 3 figs., 2 tables. **DWB, DLC**—The author analyzes the severe drought which occur in Greece during Feb. 1957, especially in the eastern regions, in the Aegean Islands, in Southern Cyclades, and as far as the extreme east of Crete. Both numerical and graphi data are presented on the distribution of rain days (≤0.1 mm) in Feb. 1957, consecutive da of drought in Feb. 1957, average number of days with rain in Feb. (1901–1930) and to number of days with rain in Feb. 1957, mean rainfall amount in Feb. (1901–1950) and amou of rainfall for Feb. 1957, and distribution of rainfall amount in Feb. 1957; the data are for stations having precipitation normals. Also the synoptic situation associated with t drought period is described. *Subject Headings:* **1. Drought, Greece (Feb. 1957) 2. Rain amount 3. Synoptic conditions for drought 4. Greece.**—*I.L.D.*

10.5–302 551.577.38(73,

§Kibler, Clarence L. and Rogers, Marvin R. (*U. S. W. B., Wash., D. C.*), **Drought relie rains for Atlantic Coastal States, Aug. 23–26, 1957.** *Monthly Weather Review*, Wash., D. 85(8):288–295, Aug. **1957.** 13 figs., 9 refs. **DWB, DLC**—Summer of 1957 was among dri on record in East. Atlantic City, Philadelphia, Washington, D. C., Greenville, S. C. a Chattanooga, Tenn., had driest July on record. A frontal wave developed along the Carol Coast (moving NNW) and bringing relief Aug. 23–26th as illustrated by surface synop moisture supply and isohyetal charts. A streamline analysis shows source of moisture c version in mid-Atlantic states. *Subject Headings:* **1. Drought, Middle Atlantic States (19 2. Record drought 3. Drought relieving storms 4. Synoptic case history studies 5. Mid Atlantic States.**—*M.R.*

10.5–303 551.577.38:551.579.5:551.573(

*Kusakabe, M. (*Fukuoka District Central Met. Obs.*), **Drought at Fukuoka, from the vie point of potential evapotranspiration.** *Journal of Agricultural Meteorology*, Tokyo, 12(2):69– Oct. **1956.** 6 tables, 3 refs. In Japanese, English summary p. 72. **DWB**—Some agrometeo logical investigations on drought were made from the viewpoint of precipitation, but the m important factor which influences drought damage is the soil moisture storage of the fie The author estimated the potential evapotranspiration from the monthly mean temperatu and calculated the water balance at Fukuoka. Some results of the calculation are shown Table 1. Water deficiency occurs in June, July, August and Sept., and it does not occur the other months. The amount of precipitation has the greatest influence on water deficien and the effect of potential evapotranspiration is not so great. The effect of soil moist storage of the previous month is not negligible. August is the most dangerous month drought, in the 66 years studied; July is next. Water deficiency is recognized in 16 years a in the other 19 years, the soil moisture storage decreases for want of precipitation. Tabl shows the drought damage in Fukuoka Prefecture, and the soil moisture storage and wa deficiency at Fukuoka. Generally speaking, water deficiency is useful as the index of droug but it does not correspond exactly because (1) water requirement of a plant differs with growth stage and (2) calculation of water balance was made from monthly data. *Sub Headings:* **1. Drought periods 2. Soil moisture deficiency 3. Potential evapotranspirati 4. Fukuoka, Japan.**—*Author's abstract.*

10.5–304 551.577.38:551.555.3

Tsuberbiller, E. A., **Agrometeorologicheskie kriterii sukhoveev.** [Agrometeorologi criteria of dry winds.] (In: Akademiia Nauk SSSR. Institut Geografii, **Sukhovei i proiskhozhdenie i borba s nimi.** Moscow, **1957.** p. 71–80. 2 tables, 7 refs.) **D** (QC940.R9A6)—A theoretical article in which the author discusses the difference betwe

e agricultural and the meteorological approach to dry-wind (Sukhovei) weather criteria and ows the necessity of combining them into agrometeorological criteria. He introduces his vn definition of dry-wind weather and establishes 2 additional indices which point out the oment after which determined values of air-saturation deficiency (if there is also a moisture ficiency in the soil) begin substantially to harm the plants. *Subject Headings:* **1. Sukhovei ects on agriculture 2. Dry periods.**—*A.M.P.*

10.5–305 551.577.5:551.588.2

Lydolph, Paul E. (*Los Angeles State College*), **Comparative analysis of the dry western torals.** *Association of American Geographers, Annals*, 47(3):213–230, Sept. **1957.** 9 figs., merous foot-refs. **DWB**—The major precipitation controls of the dry western littorals outh America, South Africa, Australia and North Africa are analyzed with the aid of veral approaches involving the relationship of precipitation to distance and direction m subtropical high pressure cells, correlation between spatial variations in sea tem-rature and precipitation perpendicular to the coasts and the relation of precipitation to rge scale oceanic and atmospheric circulation. The physical processes both in ocean and mosphere, linking precipitation and precipitation controls, are investigated with special tention to the occurrence of inversions and the formation of inversions under local conditions. he relationship of inversions to specific precipitation regimes along the arid littorals is dis-ssed and these littorals are compared in respect to prevailing characteristics of subsidence, rface contrasts and the seasonal characteristic of precipitation. The author concludes that general "normal subsidence at an optimum can reduce precipitation to about nine inches er a latitudinal distance of one or two degrees and will allow a precipitation increase of the te of approximately four inches per degree in either direction. The additive effects of rface contrasts can reduce precipitation to zero at the point of maximal subsidence and n hold it at that level against the waning effects of subsidence to low latitudes so long as tive contrast with the open-ocean circulation is maintained. Where surface contrasts are aintained at an optimum to higher latitudes, their effects can reduce precipitation by three-urths or more but cannot hold it at zero." *Subject Headings:* **1. Precipitation controls Precipitation analysis 3. Inversion-precipitation relationships 4. Coastal climates 5. Arid ttorals.**—*I.L.D.*

RAIN, SNOW AND HAIL

See also: **Ice explorations and photos, Iceland and Greenland** (Wustmann), 10.5–35; **Transport of snow by blizzards, Don River Basin** (Grishin), 10.5–275; **Electrical conductivity of rainwater, Calcutta** (Mukherjee), 10.5–340.

10.5–306 551.578.46:551.509.324.2(433)

*Brezowsky, H., **Einige Ergebnisse der Messungen der Schneenhöhe in Bad Tölz.** [Results of snow depth measurements at Bad Tölz.] *Meteorologische Rundschau*, 11(1):30–32, an./Feb. **1958.** 3 figs., 5 tables. **DWB, DLC**—A twenty-eight year record of snow depth easurements for Bad Tölz (655 m above sea level, 50 km south of Munich) is analyzed in rder to determine whether unusual winter weather phenophene, observable in the lowland, ccur also at high elevations and whether (in spite of favorable conditions for a favorable inter) it is possible to establish meaningful criteria for distinguishing individual winter types. n analysis of the 28-yr mean snow depth variation for Dec.–March by decades shows the llowing singularities: beginning of winter—1st decade in Dec.; Christmas thaw—3rd decade n Dec.; high winter—1st decade Jan.; Jan. mild weather—2nd decade in Jan.; high winter eginning—1st decade in Feb.; preparation for the decline of winter—3rd decade in Feb. and inter end—3rd decade in March. The number of days with snow cover for all 4 months lls into the following groups: 3, 9, 13, 16, 20, 24, 28 (or 31) days. Also the monthly means f snow depth fall into groups. A close relationship exists between temperature deviation om the mean and depth of snow cover. The months Dec. to March can be divided into ree types depending upon duration and depth of snow cover, namely: winter poor in snow ean depth <15 cm for at least 3 decades of continuous snow cover); winter with occasionally entiful snow (mean snow depth 15–24 cm for 6 decades of snow cover without substantial reaks); and winter with continuous plentiful snow (mean snow depth ⩾25 cm and uninter-

rupted snow cover from first Dec. decade to first or second March decade). It is conclu that there are no necessary and sufficient conditions for predicting snow situations. sufficient condition is as follows: If Dec. or Jan. has a continuous snow cover then the follow months have plentiful snow. But this condition is not necessary since many exceptions oc *Subject Headings:* **1. Snow depth date 2. Snow depth variations 3. Snow depth forecas 4. Bad Tölz, Germany.**—*I.L.D.*

10.5–307 551.578.46:551.524(7

Gold, L. W. (*Snow and Ice Section, Div. of Building Res., Natl. Res. Council, Cana* **Changes in a shallow snow cover subject to a temperate climate.** *Journal of Glaciol* London, 3(23):218–222, March **1958.** 7 figs., 4 refs. English and French summaries p. **DWB, DLC**—Observations were carried out on each significant layer of the snow cove Ottawa (lat. 45°24′N, long. 75°43′W) on the thickness of the layer, and the density, grain distribution and degree of bonding of the snow in each layer. A logarithmic dependence time was found for the layer thickness, and the density and grain size distribution. product of layer thickness times the corresponding snow density was found to be const when no melting occurred. *Subject Headings:* **1. Snow density 2. Snow cover thickn 3. Temperature effect on snow 4. Ottawa, Canada.**—*Author's abstract.*

10.5–308 551.578.46(

Gold, L. W. and Williams, G. P., **Some results of the snow survey of Canada.** *Natio Research Council of Canada. Div. of Building Research, Council Paper*, No. 38, June 19 8 p. 7 figs., table, 8 refs. "Paper presented at Eastern Snow Conference, Hanover, N. Ha shire, Feb. 9–10, 1956." **DWB** (M78.46 N277so)—This report presents some prelimin results from the survey of the physical characteristics of the snow cover which has been carr on in Canada since 1947. Comparisons of the snow hardness and of the density data are m between selected stations. The snow density distribution plots exhibited a marked simila especially for exposed stations. Other similarities were noted in the data. On the basis this analysis, Canada can be divided into five main snowfall regions: (1) The Arctic reg (2) The northern tree-line region, (3) The Prairie region, (4) The western mountain and coa region, (5) The region classified as a freeze-thaw region in Eastern Canada. *Subject Headin* **1. Snow surveys 2. Canada.**—*Authors' abstract.*

10.5–309 551.578.46:546.11:546.

Isono, K.; Komabayasi, M. and Ono, A. (*all, Geophys. Inst., Tokyo Univ.*), **On the ha of ice-crystals grown in the atmospheres of hydrogen and carbon dioxide.** *Meteorolog Society of Japan, Journal*, Ser. 2, 35(6):327–338, Dec. **1957.** 11 figs., table, 9 refs. **DWI** The results of examination of ice crystal growth at −7°C and −16°C in air, hydrogen, carbon dioxide show that the difference in the growth habit with temperature is pronoun in the case of air and carbon dioxide, but much less pronounced in the case of hydrogen mosphere. *Subject Heading:* **1. Ice crystal growth.**—*From authors' abstract.*

10.5–310 551.578.46:58(4

*McVean, D. N. (*The Nature Conservancy, Edinburgh*), **Snow cover and vegetation in Scottish Highlands.** *Weather*, London, 13(6):197–200, June **1958.** table, 3 refs. **DL** Snow depth measurements on mat-grass and dwarf heather in the Scottish Highlands 2500 to 3500 ft elevation during Nov.–June are tabulated to show variability of snow co in any given month from year to year (1954–1957), especially in Nov., Dec. and May. M mum snow depth occurs in March in the mat-grass areas, and in Jan. or Feb. in the hea mat areas. The latter, however, have only a thin covering of snow compared to the mat-g depressions. Tolerance of various species of moss, grass and heather is discussed in rela to snow and exposure. If snow eases off in June or earlier, plants protected by it during winter can thrive, if it lasts until the end of July they have too short a growing season. *Sub Headings:* **Snow cover-vegetation relationships 2. Scottish Highlands.**—*M.R.*

10.5–311 551.5

†Balabuev, A. G., **Sovremennoe sostoianie voprosov izucheniia gradovykh iavlenii.** [P ent status of research on problems of hail phenomena.] *Akademiia Nauk Gruzinskoĭ S*

iflis. Institut Geofiziki, Trudy, 13:175–191, **1954.** 33 refs. Summary in Georgian p. 190. **LC** (QC500.A55)—This review of the present state of knowledge of hail phenomena includes discussion of what should be known on hail in order to organize an effective fight against the fect of hailstorms. This can be obtained by a closer study of the formation and manifestation the phenomenon, its forecasting (mainly by means of radar), and a complete study of all ements of hail phenomena. Finally, the author presents a review of the most recent im-ortant works on hail by Soviet and foreign authors. *Subject Headings:* **1. Hail research Hail prevention.**—*A.M.P.*

HYDROMETEOROLOGY

See also: **Water loss investigation, Lake Mead, Ariz.-Nev.** (Harbeck et al.), 10.5–4; **Hydrol. yearbooks, Israel,** 10.5–24; **Hydrologic serv., U. S.** (Muranov), 10.5–66; **Hist. of hydrology, Hungary** (Muranov), 10.5–67; **Hydromet. services and networks, U.S.S.R.,** 10.5–73; **Fisheries weather forecast., Caspian Sea** (Andreev), 10.5–144; **Flood wave analysis** (Kalinin, Miliukov), 10.5–160; **Evaporation from soil** (Gardner, Fireman), 10.5–284; **Drought periods and potential evapotranspiration, Fukuoka, Japan** (Kusakabe), 10.5–303; **Water discharge measurement techniques** (Pikush), 10.5–315.

10.5–312 551.579.4:551.577.61(73)

*†American Insurance Association, N. Y., **Studies of floods and flood damage, 1952–1955. lay 1956.** 296 p. 24 figs., 12 tables, 40 refs. **DWB** (M79.4 A512)—The 5 major parts this extensive report on floods and flood damage in 1952–55, are as follows: I. Report of 955 floods by American Ins. Assoc.; II. Report on floods of Dec. 1955–Feb. 1956 in Calif., regon, Nevada, Washington and Idaho; III. Report on floods in N.E. states in 1955; IV. Re-ort on floods May 1952, revised March 1956, and V. Report on floods April 1952, revised pril 1956. All manner of statistics of damage, runoff, rainfall, isohyetal maps, previous oods and flood damage (since 1770) and descriptions of floods by basins occur in each chapter. limatic changes are discussed on p. 159 in relation to the unusual year of 1955. *Subject eadings:* **1. Flood damage 2. Floods, United States (1952–55) 3. United States.**—*M.R.*

10.5–313 551.579.4:551.482(282.247)

Chernoivanenko, I. M., **Raschet urovneĭ r. Dona na zaregulirovannom uchastke.** [Cal-ulation of the levels of the Don River in a regulated section.] *Meteorologiia i Gidrologiia,* eningrad, No. 6:34–35, June **1957.** fig., table. **DWB**—The variation of the water level ver the Tsimlyansk-Konstantinovsk section of the river is analogous to the variation of water ischarge from the Tsimlyansk reservoir. From data on the highest water levels attained y the Don River before and after construction of the Tsimlyansk reservoir, it is shown that ie highest levels of the Don River of this regulated area will be lower than the levels before onstruction of the reservoir. A graph showing the dependence of the river level at Kamy-ievskoi upon the discharge at this point and upon the water discharge from the Tsimlyansk servoir, taking into account channel flow, is presented. From this curve it is possible to trapolate the curve of discharge of water from the Tsimlyansk reservoir and also for other oints. Calculations of highest water level carried out in 1953–54 agreed with observed vels of the Don River. *Subject Headings:* **1. River level calculations 2. Reservoirs 3. Don iver.**—*I.L.D.*

10.5–314 551.579.4:355:551.508.79

†Koffman, L. A., **Stream gaging methods and equipment for military purposes.** *U. S. orps of Engineers, Military Hydrology Bulletin,* No. 3, June **1957.** 59 p. numerous figs. and arts (some fold.) and tables. 27 refs., eqs. "Prepared in connection with RAND Project 97-10-003 by Military Hydrology Research and Development Branch, U. S. Army Engineer istrict, Washington, Corps of Engineers." **DWB** (M79 U581mi)—This Bulletin is the third a series of papers dealing with various aspects of hydrology involved in military operations nd with the hydrologic techniques and methods of analysis which are considered most suitable r military use. A number of these techniques were developed in the course of Research nd Development Project No. 8-97-10-003, assigned to the Army Engineer District, Wash-

ington on 14 March 1951. Printing of this Bulletin was authorized by the Office, Chie Engineers, on 9 May 1957. The material in this Bulletin was assembled and the text wri by L. A. KOFFMAN of the Military Hydrology Branch, Army Engineer District, Washing under the supervision of F. B. BARKALOW. Source material is listed under References, special acknowledgment due the U. S. Geological Survey's manual **Stream-Gaging Proced** *Subject Headings:* **1. River gages 2. Military hydrology.**—*Author's abstract.*

10.5–315 551.482:551.5

Pikush, N. V., **Primenenie sukhoĭ soli dlia opredeleniia raskhodov vody metodom s sheniia.** [Use of dry salt for determining water discharge by the mixing method.] *Mete logiia i Gidrologiia*, Leningrad, No. 6:47–48, June **1957.** 2 refs. **DWB**—The practical of the mixing method employing salt solutions for determining water discharges from river limited to discharges of 10–20 m³/sec. This method can be expanded by using dry fine The salt was introduced in a part of the stream where the flow was turbulent at such a dista above the electrodes that it would take the water more than 2 min to flow past them at m mum speed; 0.5–0.8 kg of water for a water discharge of 1 m³/sec was used. *Subject Headi* **1. River discharge 2. Water discharge measurement techniques.**—*I.L.D.*

10.5–316 551.579.4:551.482(4

Platagea, G., **Calcularea viiturilor pluviale cu ajutorul metodei izocronelor.** [Rainst analysis by means of the method of isochrones.] *Meteorologia şi Hidrologia*, Buchar 2(3):44–53, July/Sept. **1957.** 5 figs., 6 refs., 33 eqs. **DWB**—D. L. SOKOLOVSKIĬ's method calculating river flow variations from precipitation amounts in the basin (and its extens to include the time of runoff on slopes) is explained in detail. Actual and calculated drographs are presented for Romanian rivers. *Subject Headings:* **1. Hydrographs 2. R flow 3. Precipitation amounts 4. Romania.**—*G.T.*

10.5–317 551.579.4:551.482(4

Rosescu, E., **Studiul metodelor de separare a surselor de alimentare a rîurilor din R.** [Review of methods of analyzing the sources of alimentation of Romanian rivers.] *Mete logia şi Hidrologia*, Bucharest, 2(3):53–61, July/Sept. **1957.** 7 figs., 2 refs. Also: Ujvari **Alimentarea rîurilor din R.P.R.** [Alimentation of the rivers of Romania.] *Ibid*, 2(1):17 Jan./March **1957.** 5 figs. 12 tables, 15 refs. **DWB**—In the first paper, the author revi different existing methods of river classification according to sources of alimentation and proposes a method applicable to the rivers of Romania. In the second paper rivers of Rom are classified according to the relative magnitude of the contribution of rainfall, snow melt underground water, respectively, to their alimentation. A chart of Romania shows the regi distribution of the various alimentation types. The methods of classification and of determi the percentage of the different alimentation factors are explained. *Subject Headings:* **1. R alimentation 2. Romania.**—*G.T.*

10.5–318 551.579.5:551.543

Korb, G., **Analyse der Grundwasserschwankungen im überfluteten Bergwerk Son** [Analysis of ground water surface oscillations in the flooded Sontra mine.] *Frankfurt a Universität. Meteorologisch-Geophysikalisches Institut, Bericht*, No. 6:41–45, **1956.** 2 tal 8 refs. **DWB**—Apart from earthquakes and earth movements, the oscillations of the un ground water surface of the flooded Sontra mine are due to tidal forces, periodic atmosp pressure changes (double wave) and aperiodic atmospheric pressure variations. The t forces are the principle influences on these oscillations. The tide generating potentia calculated as the sum of sine and cosine terms with constant amplitude and phase. Since frequencies of the ground water level oscillations are known, amplitude and phase are de mined by means of Fourier analysis. The Fourier coefficients are presented. The theore partial oscillations and the observed oscillations correspond satisfactorily. The influ of the diurnal double wave atmospheric pressure variations is determined from the tidal w oscillation curve. Also, the influence of aperiodic barometric pressure oscillation is analy Those manifest themselves in the surface oscillations but with negative signs. A li

lationship can be drived between water surface oscillations and atmospheric pressure variation. *Subject Headings:* **1. Ground water oscillations 2. Flooded mines 3. Tide effects Germany.**—*I.L.D.*

10.5–319 551.579.5

Werner, P. Wilh., **Some problems in non-artesian ground-water flow.** *American Geophysical Union, Transactions,* 38(4):511–518, Aug. **1957.** 2 figs., 7 refs., 18 eqs. Also: Iaasland, M., **(Discussion of) P. Wilh. Werner: Some problems in . . . (and) Reply by Verner.** *Ibid.,* 39(4):738–741, Aug. **1958.** fig., 11 refs., 5 eqs. **DWB, DLC**—This paper eals with problems relating to ground-water movement in aquifers under water-table conditions, and more particularly with the unsteady flow caused by variations in some boundary ondition or in the replenishment from the ground surface. The cases to be treated are iagrammatically shown; the first refers to the flow between two reservoirs, and the second the flow between a water divide and a reservoir. The treatment will be based on the solled Laplace transformation method, which is useful for solving some typical cases, often et in hydrology and various fields of engineering practice. Definite formulas are established, hich include the effect of a moderately sloping bottom, and the inclination of the groundater level is also taken into consideration. Separate formulas are given for the more simple se that the bottom of the aquifer is horizontal. *Subject Headings:* **1. Ground water movements 2. Laplace transformation method.**—*Author's abstract.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See: **Climatology texts.** (Landsberg), 10.5–14; **Clim. methodology and statistics,** 10.5–15; **Training courses in met.** (Neuberger, Teweles), 10.5–79; **Climate definitions** (Zamorskiĭ), 10.5–94.

CLIMATE OF PARTICULAR PLACES

See also: **Climate and geog., U.S.S.R.** (Nezhikhovskiĭ), 10.5–16; **Climate, Antarctica** (Meinardus), 10.5–61.

10.5–320 551.582.2(63):63

*Kuls, Wolfgang (*Wiesbaden*), **Agrargeographische Beobachtungen in der Umgebung von ddis Abeba.** [Agricultural geographical observations in the vicinity of Addis Ababa.] *'etermanns Geographische Mitteilungen,* Berlin, 10(4):245–251, **1957.** 5 figs., 20 refs. **DLC**—'he paper contains some brief information on precipitation and temperature conditions of the rea. The annual precipitation (1902–1938) amounts to 1270 mm, 70% of which falls from une to Sept., as compared with only 4.5% in the period Oct. to Jan. August, with 284 mm recipitation has the most rainfall, Dec. with only 8 mm has the least. Precipitation distribution is of much greater importance for agriculture than is the mean temperature variation. 'he highest mean monthly temperature of 18.4°C occurs in May, while Dec., with a 14.6°C ean, is the coldest month. *Subject Headings:* **1. Climate of Addis Ababa 2. Agricultural limatology 3. Addis Ababa, Ethiopia.**—*A.M.P.*

10.5–321 551.582.2(438)

*Paszyński, Janusz, **Zróznicowanie klimatyczne okolic Ciechocinka.** [Climatic zones the environment of Ciechocinek.] *Przegląd Geofizyczny,* Warsaw, 2(1/2):15–31, **1957.** fig., tables, 15 refs. German summary p. 30–31. **DWB, DLC**—Results of a study of the local imate of Ciechocinek health resort carried out in 1954–55 are presented and discussed. The udy consisted of simultaneous measurements, in various seasons but with special consideration the good weather period, of air temperature, humidity, wind speed and direction (with ssmann aspiration psychrometers and hand manometers), and had for its object the division

of the area into climatic zones more or less favorable for the human organism. It was fo that there are 7 different zones which can be reduced to 3 main groups. *Subject Headi* **1. Climate of Ciechocinek 2. Climatic zones 3. Ciechocinek, Poland.**—*A.M.P.*

CLIMATIC CHANGES

See: **Hist. climate, Ukraine, U.S.S.R.** (Buchinskiĭ), 10.5–22; **Japanese language texts.** (Arakawa), 10.5–29; **Ice density meas., Greenland** (Georgi), 10.5–58; **Pollen anal. and forest met., Canada** (Potzger et al.), 10.5–128.

MICROCLIMATOLOGY

See also: **Micromet. and agricult.** (Gol'tsberg), 10.5–30; **Forest microclimat., Hungary** (Papp), 10.5–127; **Forest microclimat., Mass.** (Spurr), 10.5–129; **Evaporation in forest and prairies, Wisconsin** (Selleck), 10.5–130; **Ice age theories** (Gullentops), 10.5–131; **Nocturnal temp. rise** (Mano), 10.5–259; **Explosions in coal mines** (McIntosh), 10.5–269; **Clothing climate** (Woodcock et al.), 10.5–329.

10.5–322 551.584.42:551.457(4

Glebova, M. Ia., **Osobennosti fitoklimata na poliakh osushennogo bolota.** [Charac istics of the phytoclimate of drained marshes.] *Meteorologiia i Gidrologiia*, Leningrad, 5:30–34, May **1957.** 2 figs., table, 2 refs. **DWB**—The atmospheric temperature and mois regimes in fields of drained swamps in the northwestern parts of the U.S.S.R. are analy Both experimental fields on the drained marshes and the control field in a dry valley w planted with timothy and clover. Data on the daily variations of air temperature at elevat of 20 cm and 50 cm, hourly difference in temperature and relative humidity on drained ma on a plot with a thick grass stand and on a bare field for period of 11 days (June 30–July and temperature distribution at 1300 o'clock are presented and interpreted. *Subject Headi* **1. Drained swamp microclimatology 2. Drained swamp temperatures 3. Northwest U.S.S** —*I.L.D.*

10.5–323 551.584.42:63

Wagner, Richárd, **Adatok a kopáncsi rizsföldek éghajlatához.** [Data on the climat rice fields in Kopáncs.] *Időjárás*, Budapest, 61(4):266–277, July/Aug. **1957.** 9 figs., 4 tal 6 refs. English summary p. 266. **DLC**—Microclimatological investigations in a rice f have been carried out at Kopáncs by the Climatological Institute of the University of Sze during the periods of 6–11 June and 18 July–16 Sept. 1956. This research has been execu by means of electric resistance-instruments (air-, water-, and soil-thermometers) and routine instrumentation of climatic stations. It appears from the results that large value the vertical gradient of temperature, and saturation water-vapor content, especially du the night hours, are present within the rice-field which are favorable features for the growt rice, while wide variations of temperature in the submerged soil and the quick cooling of flooding-water are a detrimental influence on it. As a consequence, it may be assumed in the development of the bruzone-disease of rice an important part is played by wea processes causing within the rice field quick and prolonged cooling of the air, the flooding-w and the soil. *Subject Headings:* **1. Rice paddy microclimatology 2. Rice culture 3. Kopá Hungary.**—*Authors' abstract.*

10.5–324 551.584.65:55

Maksimovich, G. A., **Duiushchie kolodtsy, voronki i treshchiny.** [Wind holes, funnels fissures.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Leningrad, Izvestiia*, 89(1):68–69, J Feb. **1957. DLC**—The circulation of air in communicating caves in karst deserts is expla in terms of difference in temperature between different levels below the ground. Var examples are cited together with temperature data for the U.S.S.R. Also, reports on w holes from other parts of the world are reviewed. *Subject Headings:* **1. Karst 2. Cave t peratures 3. Wind holes 4. U.S.S.R.**—*I.L.D.*

CLIMATIC CLASSIFICATION

See: **Agroclimatic handbooks, Asiatic U.S.S.R.** (Skovronskaia, Andrushko), 10.5–119.

BIOCLIMATOLOGY

See also: **Cold injury and military bioclimat.** (Whayne), 10.5–19; **Weather eff. on oyster growth, Chesapeake Bay** (Alkire), 10.5–143; **Skin temp.** (Barrueto, et al.), 10.5–156; **Racial differences in heat tolerance** (Baker), 10.5–157.

10.5–325 551.586:616.1

Kamiyama, K. (*Met. Res. Inst. Tokyo Medical and Dental Univ.*), **On effects of environ-ient condition on vasomotor reflex: the effects of pressing skin on plethysmogram.** *Papers i Meteorology and Geophysics*, Tokyo, 7(2):171–177, July **1956.** 9 figs. (incl. photos), 4 refs. **WB**—Stimuli of cold, wind, infrared radiation and putting on and off coverlets were given) sleeping children, and then their vasomotor reflex was observed. The measuring apparatus sed was the plethysmograph, the transducer of which was a strain-gage. Putting on and off ie coverlets was quickly followed by variations on the plethysmogram. Putting on the overlets caused vasoconstriction, vascular system constricts, but no significant variation in ascular system is caused by thermal stimuli which bring no dynamic stimulus directly to the kin, such as exposure to infrared radiation. *Subject Headings:* **1. Vasomotor reflexes 2. En-ironmental physiology.**—*Author's abstract.*

10.5–326 551.586:616.12:616.83

Petr, B. and Picko, V., **Der Einfluss meteorologischer Elemente auf einige Krankheiten.** Influence of meteorological elements on certain diseases.] *Wetter und Leben*, Vienna, (6/9):112–122, **1957.** fig., 8 tables. **DLC**—The authors begin with a discussion of various eteorotropic phenomena as manifested by the effect of weather elements and weather upon ulmonary, cardiovascular and other diseases; and they stress the fact that weather does not ct upon the disease as such but upon the reactivity of the individual and hence upon his ntral nervous system, especially the brain, and the need for distinguishing between true and pparent weather influences. This is followed by a detailed examination of the effect of eather upon myocardial infarction, hypertension and intestinal ulcer. Out of 370 myocardial farctions where occurrence can be attributed to climatological factors, 187 were investigated relation to atmospheric conditions. The annual incidence shows a rise during the summer onths. The analysis shows that myocardial infarction occurrence is associated with a idden change in atmospheric pressure. The incidence of fog favored the occurrence of yocardial infarctions. An analysis of the meteorological conditions on the preceding day the day on which hypertension required hospital care were analyzed for 281 cases out of a tal of 1102. Both the height of the atmospheric pressure as well as a tendency to rise used a deterioration in hypertensive individuals. Finally, 72 cases out of 111 cases of testinal ulcer were analyzed. Decreasing atmospheric pressure caused the exacerbation of is disease, atmospheric temperature had no effect while relative humidity appears to be an fluencing element. *Subject Headings:* **1. Weather effects on cardiac infarction 2. Weather fects on nervous system 3. Weather effects on ulcers.**—*I.L.D.*

10.5–327 551.586:631.4

Harradine, Frank and Jenny, Hans (*both, Calif. Univ., Berkeley*), **Influence of parent aterial and climate on texture and nitrogen and carbon contents of virgin California soils, t. 1, Texture and nitrogen contents of soils.** *Soil Science*, Baltimore, 85(5):235–243, May 958. 6 figs., 2 tables, 12 refs. **DLC**—Six hundred soil samples from the Sierra Nevada in alifornia were correlated with soil-forming factors. The variable factors were climate (from id to humid and from hot to cold) and parent materials. Soils derived from basic igneous cks have higher moisture equivalents and higher nitrogen content than soils derived from id-igneous rocks. But, per unit moisture equivalent, the acid-igneous rock derivatives ve more nitrogen than the basic ones. A linear relation exists between soil nitrogen and oisture equivalent. At constant temperature, moisture equivalents as well as nitrogen crease with increasing precipitation. At constant precipitation, nitrogen is negatively

correlated with temperature. *Subject Headings:* **1. Climatic effects on soil 2. Soil formati 3. Sierra Nevada, Calif.**—*Authors' abstract.*

10.5–328 551.586:631.525(21

Primault, B. (*Chargé des Travaux de Météorologie agricole à la Station Centrale suisse Météorologie, Zurich*), **Des critères d'acclimation du bétail en zone subtropicale.** [Criteria the acclimatization of cattle in subtropical zones.] (In: Angola. Serviço Meteorológi **Miscelanea geofisica.** Luanda, **1956.** p. 13–24. 2 figs., table, 6 refs.) **DWB** (M((A592mi)—After having briefly examined the characteristics of the mild and tropical climat the author concludes that the cattle of the temperate zones cannot, without some harm, transferred to the tropics. He suggests infusing new blood stock by selecting and cro breeding. These breeds should have the following characteristics: Little need of liqu great resistance to heat, feeble absorption of the solar radiation through the hide, great resi ance to illness, satisfactory milk production both in quantity and quality, tender and savo meat even with adult cattle. *Subject Headings:* **1. Acclimatization of cattle 2. Tropi climates 3. Tropics.**—*Author's abstract.*

10.5–329 551.586:551.584.9:(

Woodcock, Alan H.; Thwaites, H. L. and Breckenridge, J. R., **An electrical analogue studying heat transfer in dynamic situations.** *U. S. Quartermaster Research and Engineer Center. Environmental Protection Research Div., Technical Report,* EP-86, April **1958.** 17 10 figs. (incl. photos), 4 tables, 16 refs. **DWB** (M86 U585t)—An electrical analogue has b constructed to represent the heat transfer system between a clothed man and his environme The primary purpose of this analogue was to provide a visual indication of the manner which skin temperature and heat loss through clothing are affected by varying wind, temperature, activity, and clothing systems. The value of the electrical analogue approach forcing the research worker to synthesize his concepts of heat transfer is discussed. An outl of methods, using electrical analogues, for investigating the significance of various envir mental, activity, and clothing factors is presented. Examples are given of the types of pr lems which can be solved rapidly with the instrument. The possibility of using analog for planning experiments involving human subjects is discussed. *Subject Heading:* **1. Cloth climate.**—*Authors' abstract.*

UPPER AIR CLIMATOLOGY

See: **Stratospheric temps., Antarctica** (Bannon), 10.5–63.

ENVIRONMENTAL INFLUENCES

See: **Environmental res. bibliogs.,** 10.5–95; **Pollen anal. and forest met.** (Potzger et al.), 10.5–128; **Urban temp. variations, Winnipeg, Manitoba** (Einarsson, Lowe), 10.5–262; **Precipitation controls and analysis and arid littorals** (Lydolph), 10.5–305.

MISCELLANEOUS

COSMIC INFLUENCES

See also: **Solar-terrestrial rel.** (Mustel'), 10.5–32; **Meteoric dust nucleation** (Serpolay), 10.5–198; **Eclipse eff. on ionosphere** (Munro, Heisler), 10.5–208; **Corpuscular radiation and solar activity** (Kopecký), 10.5–255.

10.5–330 551.590.25:551.594.12:621

Meeks, M. L. and James, J. C., **On the influence of meteor-radiant distributions in met scatter communications.** *Institute of Radio Engineers, Proceedings,* 45(12):1724–1733, **1957.** 16 figs., 19 refs., 16 eqs. **DLC**—The relative effectiveness of various regions of atmosphere in furnishing usable meteor trails is examined on the basis of several distribut of meteor radiants. An idealized distribution in which the radiants lie near the eclipt

nalyzed and the results compared with previous calculations for a uniform radiant distribution. xperimental data on a 250-km link between Knoxville, Tenn., and Atlanta, Ga., show evidence a rather diffuse concentration of radiants near the ecliptic. A method for predicting the ntributions of meteor showers to forward-scatter propagation is developed. As an example, e August Perseid shower is studied on the Knoxville-Atlanta link. Experimental data show od agreement with the shower analysis. *Subject Headings:* **1. Meteor radiant distribution Radio communication by meteor trails.**—*Authors' abstract.*

OPTICAL PHENOMENA

See also: **Green flash bibliogs.** (O'Connell), 10.5–7; **Noctilucent cloud obs. manuals** (Grishin), 10.5–39

10.5–331 551.593.5 551.594.12:551.576

Petrov, G. D., **Po povodu dvukh stateĭ V. I. Arabadzhi.** [Apropos of 2 articles of V. I. abadzhi.] *Meteorologiia i Gidrologiia*, No. 1:57–58, Jan. **1957.** ref., 5 eqs. **DWB, DLC**— egarding the paper, **O rasseianii sveta zariazhennymi kapliami** [Scattering of light by arged drops] (*Met. i Gid.*, No. 4, **1952**), the author disputes ARABADZHI's statement that the creased reflection of light by charged water drop in thunderstorm clouds is one of the reasons r the diminished illumination of the atmosphere associated with those clouds. Actually is is simply due to great thickness of thunderstorm clouds. Furthermore, in his paper, **b elektrizatsii chastits v oblakakh** [Electrification of particles in clouds], (*see item* 8.1–378, n. 1957, *MAB*), ARABADZHI maintains that the cause of electrification of purely aqueous ouds may be the contact difference in potentials arising from the collision of drops of different spersion. ARABADZHI's assumptions, that (1) the number of particles on the surface of a iid is proportional to the pressure and that (2) the excess surface energy released during the sion of drops is transformed into the electrical energy of the charge on the drops, are not rrect. *Subject Headings:* **1. Electrification of clouds 2. Scattering of light. I. Arabadzhi, . I.**—*I.L.D.*

ELECTRICAL PHENOMENA

See also: **Radar obs. of auroras** (Collins), 10.5–164; **Solar-ionospheric rel.** (Mariani), 10.5–207; **Ionospheric electron density, Slough, Eng.** (Thomas et al.), 10.5–211; **Eddy diffusivity coeff.** (Kawano), 10.5–221; **Auroral radiations** (Hartz), 10.5–256; **Electrical charges on drops** (Godard), 10.5–288; **Radio communication by meteor trails** (Meeks, James), 10.5–330; **Electrification of clouds** (Petrov), 10.5–331; **Auroral ionization** (Unwin), 10.5–343.

10.5–332 551.594.12:551.510.535:621.396.8

Warwick, James W. and Zirin, Harold. **Research carried out in the Report Period, an. 1, 1957–March 31, 1957.** Colorado Univ. High Altitude Observatory, Climax, Contract F 19(604)-1491, Scientific Report, No. 7, June 27, **1957.** 5 p. 2 figs., 5 refs., 11 eqs. **DWB** -A technique is indicated for solving numerically the problem of the variation, $f(t)$ of the nizing Lyman-α flux throughout a sudden cosmic noise absorption (SCNA). The principal nknown in the solution is the recombination coefficient in the D-region. The observed iscontinuity in the slope of the absorption at the outset of an SCNA demonstrates the existence a hundred-fold discontinuity in the ionizing flux at the beginning of a flare. This may be terpreted as a flash phase in Lyman-α. Finally, the uncertainty in derivation of recom- nation coefficients from the time lag between flare maximum in the optical spectrum, and aximum absorption in the D-region is noted. *Subject Headings:* **1. Lyman alpha radiation ionosphere 2. Sudden cosmic noise absorption.**—*Authors' abstract.*

10.5–333 551.594.13:551.510.7:551.515.4

Hatakeyama, H. (*Met. Res. Inst., Tokyo*) and Kawano, M. (*Electro-Technical Lab., okyo*), **Abnormal increase of the electrical conductivity of the atmosphere near the ground aused by thunderstorms.** *Meteorological Society of Japan, Tokyo, 75th Anniversary Vol. the Journal*, pub. Nov. **1957.** p. 11–14. 2 figs., table, 6 refs., 10 eqs. **DWB, DLC**—

Several authors observed an abnormal increase of the electrical conductivity of the atmosph near the ground during a thunderstorm. It is considered that the abnormal increase conductivity is due to the natural radioactivity (RaB and RaC) captured by rain drops. β-ray irradiation of RaB and RaC produces small ions in the atmosphere near the grou They contribute to the abnormal increase of the electrical conductivity of the atmosph near the ground. We estimated the production of small ions by using the observed valu the electrical conductivity of the atmosphere. Then by radiological treatment we estima the quantity of RaB and RaC brought down by the thunderstorm rain. For the thunderst rain of Aug. 3, 1941, it was estimated at several hundred times of 10^{-13} curie per cm^2 of earth's surface. An observed value of the intensity of radioactivity of thunderstorm rai $50 \sim 300 \times 10^{-13}$ curie/cc. The value estimated by us is in good coincidence with the obser value. *Subject Headings:* **1. Electrical conductivity of air 2. Electrical charges near ground 3. Radioactivity in rain 4. Thunderstorm electricity.**—*Authors' abstract.*

10.5–334 551.59

Woessner, R. H.; Cobb, W. E. and Gunn, Ross (*all, Office of Physical Research, U. S. W Wash., D. C.*), **Simultaneous measurements of the positive and negative light-ion conductivi to 26 kilometers.** *Journal of Geophysical Research*, Wash., D. C., 63(1):171–180, Ma **1958.** 5 figs., 12 eqs., 11 refs. **DLC**—Continuous simultaneous measurements of the posi and negative light-ion conductivities have been made to altitudes of more than 26 km. loons carried aloft two nearly-identical self-ventilated Gerdien tubes, 60 cm in diameter 120 cm long, each connected to utilize new circuits which modulated a standard radiosc transmitter. The operating signals for the positive and negative units are arranged to pro two different characteristic pulses. Critical tests showed that saturation effects in the meas ment have been eliminated. A number of successful flights have provided more tha thousand simultaneous measurements. It is found that the negative conductivity norm exceeds the positive conductivity at levels between 5 and 18 km. The altitude of the l of equal conductivity depends critically upon the cleanliness of the air and is commonly served between 3 and 7 km. Below this level, the positive conductivity is normally in exc It is found that the conductivity is represented by an expression of the form

$$\lambda = A \exp\left[\beta Z - \varphi Z^2 + \Omega Z^3\right],$$

where the constants are different for the positive and negative conductivities. *Subject H ings:* **1. Positive ion conductivity 2. Negative ion conductivity 3. Light ion conduct measurement.**—*Authors' abstract.*

10.5–335 551.59

Kano, M. and Murai, K. (*Met. Research Inst.*), **On the velocity of the streamer in lightning discharge.** *Papers in Meteorology and Geophysics*, Tokyo, 7(3):281–287, Oct. 1 2 figs., 6 refs., 15 eqs. **DWB**—An expression of the velocity of the streamer advance alo previously ionized channel in the lightning discharge is obtained on the basis of an equa which represents the time variation of the electron density in a channel. The expression sh that, as the electron density in a previously ionized channel tends to zero, the velocity of streamer tends, as expected, to that of the streamer advance through the virgin air (i.e. o pilot streamer.) The numerical evaluation for the velocity is obtained by the graphical me in the case of the stepped streamer where the reasonable model of the tip field of the strea is assumed. The result shows that the velocity of the streamer thus calculated agrees f well with the observed value of the velocity of the stepped streamer in the lightning discha *Subject Headings:* **1. Lightning discharges 2. Lightning stroke velocities.**—*Authors' abstr*

10.5–336 551.594.22:551.59

Kilinski, Erich v., **Spitzenstrom und Potentialgefälle.** [Point discharge and pote gradient.] *Zeitschrift für Meteorologie*, Berlin, 11(5/6):135–139, May/June **1957.** 3 6 refs., eqs. **DWB, DLC**—The validity of WHIPPLE and SCRASE's empirical equa $I = a(G^2 - M^2)$ expressing the relationship between point discharge and potential gradient investigated by the author and found to hold for certain mean values but nor for indivi

alues. The role of space charges leading to ionic flow, and of the wind which imparted additional motion to the ions in disturbing the relationship between point discharge and potential radient, is considered. The latter is investigated by studying point discharge currents with a iniature pointed pole in an artificial field established between two plates with one of the lates having a voltage that ranges from −2000 to +2000 volts. The resulting curve and quation, $I=a(V^2-M^2)$ confirms the above equation of WHIPPLE and SCRASE. Convection irrents produced by artificial wind disturb this relationship considerably. At a sufficiently igh voltage St. Elmo's fire could be produced in this artificial field but it could be destroyed y blowing upon the point of the pole. *Subject Heading:* **1. Point discharge-potential gradient elationships.**—*I.L.D.*

10.5–337 551.594.221:778.37

Brook, Marx, **Thunderstorm electricity,** New Mexico Institute of Mining and Technology. esearch and Development Div., Socorro, Contract DA-36-039 SC-71145, Project DA 3-99-07-22; Signal Corps Project 172B, Report No. 7, Quarterly Report for period of July 15–Oct. 15, **957.** 17 p. 27 figs., 3 refs. **DWB** (M94.21 N532ta)—Preliminary results of the 1957 ghtning study are presented and discussed. The two-antenna technique for observing ectric-field changes proved to be very satisfactory. The precise instant of onset of electrical ctivity in a cloud is more easily determined with the high-frequency, short time-constant 0.3 m/sec) antenna than with the long time-constant (3 sec) antenna. Considerable pulse ctivity throughout the slow as well as fast field-change intervals is reported. Photomultiplier ecords are shown which, along with the high-frequency antenna, indicate that the luminosity ollows the field changes in an identical series of burst pulses. The steady component of uminosity is small. Photographs of a number of cloud and ground strokes, taken with a lowly moving K-38 camera, are presented. A cloud stroke is shown which exhibits multiple ischarges in the same channel. A number of stereophotographs of lightning strokes are also ncluded. *Subject Headings:* **1. Thunderstorm electricity 2. Lightning strokes 3. Lightning hotography.**—*Author's abstract.*

10.5–338 551.594.222:551.594.11:551.55

Chalmers, J. Allan (*Physics Dept., Univ. of Durham*), **Point-discharge current, potential radient and wind-speed.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4): 01–302, **1957.** table, 5 refs., 4 eqs. **DLC**—S. CHAPMAN (1956), LARGE and PIERCE (1957), KIRKMAN and CHALMERS (1957) and CHALMERS and MAPLESON (1955) give widely different ormulas for point-discharge-potential gradient-wind speed relations for natural atmospheric otential gradients (and also for artificial fields). Discrepancies can be removed by careful hoice of constants A, V_0 and c, making it possible to use LARGE and PIERCE's (1957) formula $=A(V-V^3)(W^2+c^2V^2)^{\frac{1}{2}}$ where I is the current, V the potential of the point relative to its urroundings and W the wind speed. A comparison of the 4 formulas is made in a table iving computed experimental results for A, c^2 and V_0. *Subject Headings:* **1. Point discharge-otential gradient-wind speed relationships 2. Atmospheric potential gradients.**—*M.R.*

10.5–339 551.594.223

Kozan-Beletskiĭ, G. I., **K voprosu o prirode sharovoĭ molnii.** [On the nature of ball ghtning.] *Priroda*, Moscow, 46(6):71–73, June **1957.** 2 figs., ref. **DLC**—In describing wo interesting cases when ball lightning collided with airplanes flying in thunderstorm clouds t 5000 and 2500 m heights, the author disproves the idea that ball lightning displacements re determined by the air current direction. On the contrary, the cited examples confirm cademician P. L. KAPITSA's hypothesis on the physical sources of ball lightning formation. *ubject Heading:* **1. Ball lightning.**—*A.M.P.*

10.5–340 551.594.253:551.578.11

Mukherjee, A. K. (*Met. Office, Jodhpur*), **Electrical conductivity of monsoon rain water.** *ndian Journal of Meteorology and Geophysics*, New Delhi, 9(1):67–71, Jan. **1958.** fig., table, refs. **DWB, DLC**—Electrical conductivities of some samples of monsoon rain water were neasured at Jadavpur, Calcutta. In some cases it was found that there was no systematic ariation of conductivity while in a few other cases conductivity was observed to decrease with

progress of rain and increase only at the end when the intensity of rain became very lo Conductivity was also seen to increase and intensity of rain decrease steadily with progress rain. In the last case the dependance of conductivity on intensity of rain is found to expressible by the relationship: conductivity α (intensity)$^{-m}$, where m is a positive consta Explanations for these variations have been suggested. *Subject Headings:* **1. Electrical co ductivity of rainwater 2. Rainfall intensity-electricity relationships 3. Calcutta, India** *Author's abstract.*

AURORAS

See also: **F-layer tilts** (Steiṅ), 10.5–216.

10.5–341 551.59

Poliarnoe siianie 21–22 ianvaria 1957 goda. [Aurora of Jan. 21–22, 1957.] *Priro* Moscow, 46(12):83–85, Dec. **1957.** photo. **DLC**—This is a review of information on aurora described by a number of eye witnesses from the Moscow, Sumy (Ukraine), Yarosl and Murmansk Oblasts and mailed to the Murmansk branch of NIZMIR (Scientific Resea Institute of Terrestrial Magnetism, Ionosphere and Radio-wave Propagation). The aur was an outstanding geophysical phenomenon. Its origin was linked with an increase of so activity. Its characteristic feature was the pre-eminently red color in more southern regio which indicates its great height and its increased intensity. The aurora was accompan by a very intensive ionospheric-magnetic disturbance and an interruption of radio communi tion on almost all lines. *Subject Headings:* **1. Aurora, Jan. 21–22, 1957 2. U.S.S.R.**—*A.M*

10.5–342 551.594.5:551.50

Seed, T. J., (*Univ. of Canterbury, New Zealand*), **V.H.F. observations on the aurora a tralis.** *Journal of Geophysical Research,* Wash., D. C., 63(3):517–526, Sept. **1958.** 3 fi 20 refs. **DLC**—Investigation of the aurora australis at a radio frequency of 69 Mc/s is report A value for the range exponent in the radar equation has been determined and values of reflection coefficient deduced. Mechanisms of auroral reflection of radio waves are discuss and only those involving column models are found to be substantiated. Noise emission fr auroral ionisation has been observed and measured at 69 Mc/s. *Subject Headings:* **1. Auro observation 2. Radar observation of auroras.**—*Author's abstract.*

10.5–343 551.594.51:551.594

Unwin, R. S. (*IGY Station of Dominion Physical Lab., Dept. of Sci. & Indus. Res., N Zealand*), **The geometry of auroral ionization.** *Journal of Geophysical Research,* Wash., D. 63(3):501–506, Sept. **1958.** 5 figs., 7 refs. **DLC**—New evidence is presented which sh that VHF radio echoes from auroral ionization are reflections from aspect-sensitive colu aligned with the earth's magnetic field. Previous experimental data, interpreted in terms distribution of ionization along a line of magnetic latitude, are shown to be consistent with hypothesis. *Subject Heading:* **1. Auroral ionization.**—*Author's abstract.*

PART II. ANNOTATED BIBLIOGRAPHY ON OZONE IN THE ATMOSPHERE (1858–1953)

By: *Mary L. Rice* and *Geza Thuronyi*

INTRODUCTION

As early as 1858 Houzeau (*see* 10E–1) found evidence of ozone in the atmosphere. Research n the absorption spectrum of ozone was carried out in the laboratory by Chappuis (10E–3), Hartley 0E–4) and others. Fabry and Buisson (10E–6) were the first to recognize that the largest quantity ozone is in the upper atmosphere. Ever since these early discoveries the problem of the quantity ozone in the atmosphere, its horizontal and vertical distribution, seasonal and diurnal variations, lation with various geophysical and meteorological factors, etc., have continuously held the interest research meteorologists, and this interest has grown as new techniques have been developed hemical, spectroscopic, radiosonde, rocket, etc.), allowing more exact formulation and analysis the many problems involved. Recently ozone research has received considerable emphasis in nnection with the International Geophysical Year, in the program of which it occupies an imrtant place.

A vast amount of literature has accumulated on atmospheric ozone in the last 100 years. Much this literature (up to 1950) has been analyzed in several excellent reviews and bibliographies (see 0E–15, –30, –48, –53, –56, –83, –95, –114). We feel justified in referring to these bibliographies r the early literature and devoting most of our available space to the literature that has been ıblished since 1950 and has not yet appeared in any major bibliographic compilation. However me of the more important early works have been included for historic background. In spite limiting our material mostly to that published in the last 10 years, we find such an abundance of terature that we have been forced to publish this bibliography in two parts, one covering the period 358–1953 and the other 1954–1959. Part II will be published in the June 1959 issue of *MAB*.

A detailed guide to the subject matter covered will be found in the Subject Outline below; cations of areas where measurements were made will be found in the Geographic Outline.

This bibliography was prepared for and with support from the U. S. Weather Bureau.

OUTLINE OF CONTENTS

SUBJECT OUTLINE

mprehensive Works
TEXTBOOKS AND TECHNICAL BOOKS
Shaw (1942), 10E–37
Fabry (1950), 10E–56
Prokof'eva (1951), 10E–95
Mitra (1952), 10E–114
MONOGRAPHS, EXTENSIVE REPORTS AND MAJOR ARTICLES
Dobson (1926/30), 10E–9
Chapman (1930), 10E–14
Götz (1931), 10E–15
O'Brien (1936), 10E–26
Gauzit (1938), 10E–29
Götz (1938), 10E–30
Dobson (1946), 10E–41
Dütsch (1946), 10E–42
Craig (1950), 10E–53
Univ. of New Mexico (1948/50), 10E–63
Univ. of Alaska (1951), 10E–74
Götz (1951), 10E–83
Ohio State Univ. (1951), 10E–91
Langlo (1952), 10E–113
CONCISE GENERAL DISCUSSIONS, 10E–105, –119, –123
BIBLIOGRAPHIES, 10E–15, –30, –48, –53, –56, –83, –95, –114, –123
CONFERENCES
Paris (May 1929), 10E–13
Oxford (Sept. 1936), 10E–24
Tharandt (April 1944), 10E–48
Oxford (Sept. 1952), 10E–139
Brussels (Aug./Sept. 1951), 10E–140
Instruments and Methods
GENERAL, 10E–63, –95, –140
CHEMICAL METHODS, 10E–21, –108, –110, –115, –128, –132
Potassium iodide reaction, 10E–1, –79, –88, –103, –106, –126, –128, –149
Fluorescein, 10E–25, –160
Arsenite, 10E–74

Silica gel, 10E–128
Electrometric method, 10E–121
Absorption tube method, 10E–76
Automatic recording device for surface and airplane use, 10E–75
Spectral Analysis
Spectrophotography, 10E–8, –25, –35, –84, –99
Portable spectrophotometer, 10E–133
Quartz spectrograph, 10E–102, –129
High resolution grating spectrometer, 10E–91
Umkehr effect, 10E–16, –59
Accounting for secondary scattering, 10E–122, –140
Photoelectric Meters, 10E–104
Filter Radiometry, 10E–159
Pyrgeometers, 10E–86
Air-borne Instruments
Balloon-borne spectrographs, 10E–26, –34, –63, –69, –97
Ozone radiosonde (ozonesonde), 10E–46, –98, –144, –145, –147
Balloon-borne air sampling device, 10E–62
Aircraft measurements, 10E–75
Rocket measurements, 10E–84, –111, –129
Lunar Eclipse Measurements, 10E–44, –45, –50, –92, –93, –117, –118

Results of Measurements
Comprehensive Data, 10E–9, –24, –42, –48, –56, –95
Reduced Thickness, 10E–109, –127
In Arctic, 10E–22, –71, –140
Latitudinal distribution, 10E–87, –151
Seasonal variation, 10E–20, –28, –33, –52, –57, –64, –71, –112, –143
Diurnal variation, 10E–112, –153
Vertical Distribution, 10E–19, –23, –25 to –27, –30, –34, –35, –41, –49, –50, –59, –63, –64, –67, –69, –84, –93, –97, –111, –122, –140
Latitudinal distribution, 10E–117, –118, –143, –154
Surface Concentration, 10E–32, –39, –63, –140, –162
In Arctic, 10E–21, –74, –101
In polluted city areas, 10E–103, –106
Seasonal variation, 10E–82
Height of the Ozone Layer, 10E–8, –11, –44, –49
Ozone Spectrum
Ultraviolet, 10E–2, –4, –6, to –7, –35, –66, –138, –143
Visible, 10E–3, –137, –143
Infrared, 10E–5, –80, –91, –134, –142, –158
Ozone Decomposition, 10E–130, –136, –1

Factors Affecting Ozone
Meteorological Factors, 10E–9, –31, –65, –95, –140
Photochemical reactions in upper atmosphere, 10E–14, –17, –27, –38, –40, –60, –61, –77, –140, –150, –152
Tropopause height, 10E–10, –18, –40, –70, –148, –154
Depressions, 10E–39, –135
Air masses, 10E–65, –82, –116, –135
General circulation, 10E–113
Meridional flow, 10E–87, –96
Monsoon circulation, 10E–28
Air movements, 10E–27, –32, –42, –116, –124, –146, –148, –162
Vertical motion, 10E–68, –89, –149, –15
Turbulent transfer, 10E–85, –90, –96, –150, –151
Temperature, 10E–55
Humidity, 10E–90, –146, –149, –156, –1
Cloudiness, 10E–20, –90, –124, –130
Fog, 10E–32, –107, –156
Föhn, 10E–32, –135, –156
Thunderstorms, 10E–107
Solar Activity, 10E–9, –12, –94
Ionospheric Disturbances, 10E–81, –140
Exhaust Gases, 10E–130, –162

Ozone Effects
Ozonosphere Temperature, 10E–43, –71 to –73, –78, –125, –140, –141, –161
Thermal Balance of Earth and Atmosphere, 10E–142
Color of Sky, 10E–4, –137
Ionospheric Ionization (as affected ozone shadow), 10E–45
Bursting of Balloons, 10E–70
Rubber Cracking, 10E–120

Applications
Study of Atmospheric Circulation, 10 58, –131
Study of Air Motions in Upper Atmosphere, 10E–157
Calculation of the Height of the Sodi D-Line, 10E–45

GEOGRAPHICAL OUTLINE

Africa
Egypt
Helwan, 10E–9

Asia
Afghanistan
Kabul, 10E–112
China
Zô-Sè Observatory, 10E–28
India
Abu Mt., 10E–122, –153, –154
Ahmedabad, 10E–153
Bombay, 10E–33
Delhi, 10E–49, –67
Kodaikanal, 10E–9
Poona, 10E–49

JAPAN
Mt. Fuji, 10E–20
Australia
CHRISTCHURCH, 10E–9
Europe
BRITISH ISLES
England
Oxford, 10E–9, –54, –148
Ireland
Valencia, 10E–9, –54
Scotland
Aberdeen, 10E–54
Eskdalemuir, 10E–54
Lerwick, 10E–9, –54
DENMARK
Aarhus, 10E–65
FRANCE
Marseille, 10E–13
Mont-Ventoux, 10E–35
Val Joyeux, 10E–132
GERMANY, 10E–146
Bad Kissingen, 10E–162
Baden, 10E–116
Lindenberg, 10E–9, –10
Nebelhorn, 10E–90, –149
Oberstdorf, 10E–90, –149
Potsdam, 10E–109
Weissenau, 10E–69
NORWAY
Spitsbergen
Kingsbay, 10E–16
Tromsö, 10E–23, –64, –65, –140, –143
SWEDEN
Abisko, 10E–9, –22, –71
SWITZERLAND
Arosa, 10E–9, –11, –13, –65, –82, –99, –143
U.S.S.R., 10E–104
Elbrus, 10E–25
Matsesta, 10E–66
Pavlovsk, 10E–66
Sevastopol, 10E–66
North America
CANADA, 10E–13
Edmonton, 10E–135, –140
GREENLAND
Scoresby Sound, 10E–21
UNITED STATES
Alaska
College, 10E–74, –101
Arizona
Flagstaff, 10E–34
California
Los Angeles, 10E–103
Table Mt., 10E–9
Colorado
Climax, 10E–127
New Mexico, 10E–47, –75, –123, –141
Sacramento Peak, 10E–159
White Sands, 10E–51, –84, –111, –129
Ohio
Akron, 10E–120
Washington, D. C., 10E–52, –57
South America
CHILE
Montezuma, 10E–9

1858–1890

10E–1 551.510.534

Houzeau, A., **Preuve de la présence dans l'atmosphère d'un nouveau principe gazeux, l'oxygène naissant.** [Proof of the presence in the atmosphere of a new gas—ozone.] *Académie des Sciences, Paris, Comptes Rendus*, 46:89–91, **1858.**—A reaction of potassium iodide exposed to atmospheric air provides evidence of the presence of ozone in the atmosphere. *Subject Heading:* **1. Ozone.**—*G.T.*

10E–2 551.510.534:535.34

Cornu, A., **Sur la limite ultra-violette du spectre solaire.** [On the ultraviolet limit of the solar spectrum.] *Académie des Sciences, Paris, Comptes Rendus*, 88:1101–1108, **1897.** fig., tables, 2 eqs. Also his: **Sur l'absorption par l'atmosphère des radiations ultra-violettes.** [Atmospheric absorption of ultraviolet radiation.] *Ibid.*, p. 1285–1290. Also his: **Observation de la limite ultraviolette du spectre solaire à diverses altitudes.** [Observation of the ultraviolet limit of the solar spectrum at different altitudes.] *Ibid.*, 89:808–814, **1897.** table. **DLC**—Measurements of the solar spectrum at different hours of the day, in different seasons with different equipment and at various altitudes (2570 m, 1650 m and 660 m) lead to the conclusion that the solar ultraviolet spectrum is limited by atmospheric absorption which varies slightly with altitude. *Subject Heading:* **1. Ozone absorption spectra.**—*G.T.*

10E–3 551.510.534:535.34

Chappuis, J., **Sur le spectre d'absorption de l'ozone.** [Absorption spectrum of ozone.] *Académie des Sciences, Paris, Comptes Rendus*, 91:985–986, **1880.** Also his: **Sur le spectre d'absorption de l'ozone.** *Ibid.*, 94:858–860, **1882. DLC**—The existence of eleven bands identified in the absorption spectrum of ozone under laboratory conditions is reported and the wavelengths corresponding to each band are listed (2nd paper). A comparison of these bands with telluric bands reported by other authors shows that two of the ozone bands correspond to unidentified atmospheric bands observed by ÅNGSTRÖM. *Subject Headings:* **1. Ozone absorption spectra 2. Chappuis bands.**—*G.T.*

10E–4 551.510.534:551.521.17:535

Hartley, W. N., **On the absorption spectrum of ozone.** *Chemical Society, London, Jour* 39:57–60, **1881.** figs. Also his: **On the absorption of solar rays by atmospheric ozone.** *Ib* p. 111–128. fig., tables. **DLC**—In the first paper a laboratory arrangement for spectrosc analysis of ozone is described and the absorption spectra obtained for different amounts of ozone presented. In the second article the author considers: a) ozone amounts measured in the atmosph by chemical methods, b) ozone spectra obtained in the laboratory and c) atmospheric absorpt spectra. He concludes that ozone is a normal constituent of the upper atmosphere, that its c centration is larger there than at the earth's surface, that its presence is sufficient to account for limitation of the UV solar spectrum and that the blue tint of the atmosphere is due to ozone. *Sub Headings:* **1. Ozone absorption spectra 2. Hartley bands.**—*G.T.*

10E–5 551.510.534:535

Huggins, William, **On a new group of lines in the photographic spectrum of Sirius.** *Ro Society of London, Proceedings,* 48(294):216–217, Sept. **1890.**—Lists six new lines in the spectrum Sirius: λ 3338, 3311, 3278, 3254, 3226, 3199. *Subject Headings:* **1. Ozone absorption spectra 2. us 3. Huggins bands.**—*G.T.*

1913–1925

10E–6 551.510.534:551.521.17:53

Fabry, Ch. and Buisson, H., **L'absorption de l'ultra-violet par l'ozone et la limite du spe solaire.** [Absorption of ultraviolet by ozone and the limit of the solar spectrum.] *Journa Physique,* Paris, Ser. 5, 3:196–206, **1913.** 4 figs., foot-refs. **DLC**—Describes a photogramme method for determining UV radiation absorption by ozone in laboratory conditions. Compar of results of such measurements with similar measurements made in the atmosphere (1912) lead t estimated 5 mm reduced thickness of atmospheric ozone. From chemical measurements at earth's surface it is inferred that ozone is present only at very high altitudes, where it is produ by extreme ultraviolet solar radiation. *Subject Headings:* **1. Ultraviolet absorption 2. Oz absorption spectra.**—*G.T.*

10E–7 551.510.534:53

Fowler, A. and Strutt, R. J., **Absorption bands of atmospheric ozone in the spectrum of and stars.** *Royal Society of London, Proceedings,* 93:577–586. 2 tables, plate (facing p. 5 **1917. DLC**—Reviews work of earlier investigators. They describe their experiments in d which gave conclusive evidence regarding the limitation of the solar spectrum by ozone absorpt Table I gives wave lengths of ozone absorption bands and Table II compares ultraviolet band Sirius (HUGGINS, KOHL, FOWLER and STRUTT) and ozone. *Subject Headings:* **1. Stellar spectros 2. Ozone absorption spectra.**—*M.L.R.*

10E–8 551.510

Cabannes, J. and Dufay, J., **Mesure de l'altitude de la couche d'ozone dans l'atmosph** [Measurement of the height of the ozone layer in the atmosphere.] *Académie des Sciences, P Comptes Rendus,* 181:302–304, **1925.** refs. **DLC**—A spectrophotographic method is descri whereby the height of the ozone layer can be determined if three exposures of equal duration obtained, one at noon and two in the evening, with zenith angles of 45°, 80° and 90°, respecti Ozone layer heights estimated by this method averaged around 50 km. *Subject Heading:* **1. O layer height.**—*G.T.*

1926–1929

10E–9 551.510.534:551

*Dobson, G. M. B.; Harrison, D. N. and Lawrence, J., **Measurements of the amount of o in the earth's atmosphere and its relations to other geophysical conditions.** *Royal Society of Lon Proceedings, Ser. A,* 110(756):660–693, April, **1926.** 8 tables, 6 figs., foot-refs. 5 eqs. **Pt** *Ibid.,* 114(768):521–541, April **1927.** 8 tables, 4 figs., foot-refs. **Pt. III,** *Ibid.,* 122(790):456 Feb. **1929.** 9 tables, 8 figs., foot-refs. **Pt. IV,** *Ibid.,* 129(811):411–433, Nov. **1930.** 3 tables, 4 foot refs. **DLC**—Covers 5 years of observation. In the first paper the results of measuremen about 200 days at Oxford in 1925 are discussed. Method of observation is explained and the paratus described. Data indicated: 1) a marked yearly period with the maximum in spring an minimum in late autumn, 2) a 27-day period, 3) no diurnal variation. The second paper deals observations made at Oxford, Valencia (S.W. Ireland), Lerwick, Abisko, Lindenberg, Arosa Montezuma (near Calama, Chile). Most of the data were obtained over a period of 4 mont 1926 at four stations. A marked connection between the amount of ozone and meteorolo upper air conditions was found. Connections with terrestrial magnetism and possibly with sun are also indicated. Pt. III is concerned with the distribution of ozone in cyclones and anticycl

sing the same stations used previously and observations made in 1926, 1927 and 1928 (record varies r different stations). Results confirm the close results between the amount of ozone and the essure distribution. Simultaneous observations at 6 stations in N.W. Europe gave a fair idea the distribution of ozone with different pressure distributions. Pt. IV continues the study of zone-pressure relationships. The spectrograph used in the previous studies were redistributed Arosa, Table Mt., Helwân, Kodaikanal and Christchurch) in order to observe the distribution of zone over the world at different times of the year. Data are for late 1928 to late 1929. Figs. ow the annual variations. Detailed conclusions will be found in Pt. IV, p. 428–433. *Subject eadings:* **1. Ozone data 2. Ozone variations 3. Ozone—pressure relationships.**—*M.L.R.*

10E–10 551.510.534:546.214

*Duckert, Paul, **Messungen des Ozongehaltes über Lindenberg.** [Measurements of ozone ntent over Lindenberg.] *Beiträge zur Physik der freien Atmosphäre*, 4(4):219–239, **1928.** 12 gs., 4 tables, refs., eqs. **DLC**—A scatter diagram shows a strong negative correlation between eight of the tropopause and the thickness of the equivalent ozone layer, based on 27 balloon ascents Lindenberg, and the detailed ozone data obtained there during July–Oct. 1926 and April–Oct. 927 (DOBSON's method). A stronger correlation exists between ozone thickness and density of air stratosphere. A model temperature distribution extrapolated on the basis of acoustical soundings 50 km height shows a warm region in the ozone layer at 40 km, reaching +37°C at 45 km. (*Same em as* 5D–52, April 1954, *M.A.B.*) *Subject Headings:* **1. Tropopause ozone relationships 2. Ozone ata 3. Stratospheric density 4. Temperature of the stratosphere 5. Lindenberg, Germany.** *–M.R.*

10E–11 551.510.534(494.5)

*Götz, F. W. P. and Dobson, G. M. B., **Observations of the height of ozone in the upper atmos-here, Pt. 1.** *Royal Society of London, Proceedings, Ser. A*, 120(785):251–259, Sept. **1928.** table, figs., refs. Also their: **Observations of the height of ozone in the upper atmosphere, Pt. 2.** *Ibid.*, 25:292, **1929. DLC**—The first paper is based on some 50 observations made in 1927 and 1928 t Arosa. Purpose was to determine variations in height of ozone. Method of obtaining height is escribed. Table shows date of observation, estimated height of ozone, ozone value, surface pressure nd character of height estimate (good, fair, poor). Average height of ozone appears to be between 0 and 40 km above sea level, height is greatest when the amount of ozone is large and vice versa, nd there is evidence of an increase from autumn to spring. The second paper deals with an addi-onal 6 months of observation. The most important result was "that the average height is not ower when there is much ozone than when there is little ozone." *Subject Headings:* **1. Ozone height ariations 2. Arosa, Switzerland.**—*M.L.R.*

10E–12 551.510.534

Fowle, F. E., **Atmospheric ozone: its relation to some solar and terrestrial phenomena.** *Smith-onian Miscellaneous Collections*, 81(11), **1929.** 27 p. tables, 13 figs., foot-refs. **DLC**—The amount energy absorbed from the incoming solar radiation by the yellow ozone band (Chappuis band) as been used to measure the variations of atmospheric ozone during the years 1921 to 1928 in the Northern and Southern Hemispheres. The resulting values show a distinct march in both hemi-pheres with the maxima in the Northern Hemisphere occurring between April and May and the inima between August and November; in the Southern Hemisphere the maxima occur between ugust and September and the minima between April and May. A marked relationship between zone and Wolfer sunspot numbers appears in the Northern Hemisphere; no such marked rela-onship appears in Southern Hemisphere. *Subject Headings:* **1. Ozone absorption of incoming adiation 2. Chappuis bands 3. Ozone variations.**—*Author's abstract.*

10E–13 551.510.534:061.3

Réunion de l'Ozone et de l'Absorption Atmosphérique, Paris, May 15–17, 1929, **Rapport** [Report], d. by Ch. Fabry. *Beiträge zur Geophysik*, Leipzig, 24(1):1–77, **1929.** figs., tables, refs., eqs. **DLC**—Some 30 papers presented at an international conference are included in this report in full summarized form. The papers deal with instruments (universal spectrometer, ultraviolet pectrograph, double spectrograph, etc.), spectral transmissivity of the atmosphere, vertical dis-ibution of ozone, stratospheric temperature, weather relations, measurements at Marseille, Arosa, anada, etc. Data and instrument diagrams are included in several of the papers. *Subject Head-gs:* **1. Ozone conferences 2. Réunion de l'Ozone et de l'Absorption Atmosphérique, Paris, 1929. Fabry, Ch.** (*ed.*).—*G.T.*

1930–1934

10E–14 551.510.535:546.214

Chapman, Sydney, **A theory of upper-atmospheric ozone.** *Royal Meteorological Society, Memoirs*, 3(26):103–125, June **1930.** 13 refs., 49 eqs. **DLC**—This is the pioneer monograph on the

quantitative theory attempting to explain known variations in atmospheric ozone: diffusion, c sociation by solar ultraviolet radiation, decomposition and recombination. The known facts first enumerated, the reactions set forth, for both formation and disappearance of O_3, the bimolecu thermal decomposition discussed, two-and three-body reactions, coefficients of reaction, chemi equilibrium of densest part of O_3 layer, diurnal, day to day, seasonal, latitudinal and solar cycli variations treated in detail. It was assumed that O_3 was uniformly distributed in a 10 km th layer with no convection or diffusion and thermal decomposition negligible except with 11 y sunspot cycle variations, dissociation of O_2 assumed to be by UV (1300–1800 Å) and decomposit of O_3 by 2300 to 2900 Å radiation. Day to day variations are slight. (*Same item as* 6E–2, M 1955, *MAB.*) *Subject Headings:* **1. Ozone photochemistry 2. Ozone variations.**—*M.R.*

10E–15 551.510.5

†Götz, F. W. Paul, **Das atmosphärische Ozon.** [Atmospheric ozone.] *Ergebnisse der Kos schen Physik*, Leipzig, 1:180–235, **1931.** 41 figs., 13 tables, eqs., bibliog. p. 230–235 (122 item **DLC**—Most of the important contributions to knowledge of atmospheric ozone before 1931 (items listed in bibliography), especially the most recent, intensive studies made from 1927–30, reviewed and the results presented in analytical form. Measurement by spectrographic (U visible and infrared) techniques, instruments, light intensity, lunar and acoustical methods; opt and chemical methods for surface O_3 determination; regular and irregular changes in O_3 distribut with time and place (regional, annual, aperiodic, height, latitude); biological effects, temperat stratification and climatic effects, effects on acoustical propagation; and theories (solar radiati corpuscular and cosmic ray). (*Same item as* 6B–22, Feb. 1955, *MAB.*) *Subject Headings:* **1. Oz research 2. Ozone theories 3. Ozone measurement techniques.**—*M.R.*

10E–16 551.521.1:551.510.534(9

Götz, F. W. Paul, **Zum Strahlungsklima des Spitzbergensommers. Strahlungs- und Oz messungen in der Königsbucht 1929.** [Radiation climate in the summer at Spitsbergen. Radiati and ozone measurements in Kingsbay, 1929.] *Beiträge zur Geophysik*, 31:119–154, **1931.** 10 fi 19 tables, refs. **DLC**—Results of global radiation, filtered radiation and spectral UV radiat measurements made on Spitsbergen in the summer of 1929 are reported. Ozone values derived fr UV spectra are presented and discussed in detail. The paper contains the first published discuss of the Umkehr effect and its application to measurement of the height of the ozone layer (p. 1 148). *Subject Headings:* **1. Ozone in Arctic 2. Umkehr effect 3. Radiation data 4. Kingsb Spitsbergen.**—*G.T.*

10E–17 551.510.534:54

Mecke, R., **The photochemical ozone equilibrium in the atmosphere.** *Faraday Society, Lon Transactions*, 27(8):375–377, Aug. **1931.** fig., refs., 5 eqs. **DLC**—On the basis of the two prim photochemical reactions $O_3+h\nu(<\lambda 2655)=O_2'+O'$ and $O_2+O_2''(<\lambda 2025)=O_3+O'$ and sev secondary reactions (all adding up to photochemical equilibrium of ozone) a relation between mospheric pressure and ozone concentration is developed. (*Same item as* 6E–5, May 1955, *MA Subject Headings:* **1. Photochemical equilibrium of ozone 2. Ozone photochemistry.**—*G.T.*

10E–18 551.510.534:551

Petersen, H., **Über die Ursache der engen Korrelation des atmosphärischen Ozongehalte den meteorologischen Verhältnissen.** [On the cause of the close correlation between atmosph ozone and meteorological conditions.] *Beiträge zur Geophysik*, Leipzig, 32:428–433, **1931.** refs. English summary p. 428.—The possibility is considered of explaining the correlation of amount of ozone in the atmosphere with the meteorological conditions as a consequence of cycl and anticyclonic currents in the upper strata of the atmosphere. As shown by CHAPMAN MILNE, the coefficient of kinematic viscosity must be great at the very great heights, due to decrease of the density of air. From meteorological observations, we have learned that kinem viscosity will decrease rapidly upward from the ground, due to the formation of eddies in the gr layer. Thus we have in the atmosphere an intermediate layer of small kinematic viscosity which the viscosity will increase both upward and downward, the ground value being reached a at about 60 km. On this base, it seems to be a reasonable suggestion that a raising or sinkin the niveau surfaces at the tropopause will be followed by a diminishing or growing of the amou ozone. A comparison with the observational facts, as put down by DOBSON, gives a rather agreement. *Subject Heading:* **1. Ozone-cyclone relationships.**—*Author's summary.*

10E–19 551.510.534:546

Chalonge, Daniel, **Sur la répartition de l'ozone dans l'atmosphère terrestre.** [Ozone tribution in the earth's atmosphere.] *Journal de Physique et le Radium*, Paris, Ser. 7, 3(1):21 Jan. **1932.** 10 figs., 2 tables, eqs. **DLC**—Recent studies (GÖTZ, DOBSON, CHALONGE and DU

the radiation of the blue sky suggest the presence of ozone in the scattering layer of the atmosphere. theory is advanced which accounts for the peculiarities observed in various experimental studies, pecially those of DOBSON, and shows that ozone must be present in appreciable quantities from titudes below 20 km up to above 80 km, its concentration in air increasing with height. *Subject eading:* **1. Ozone distribution.**—*Partial transl. of author's abstract.*

10E–20 551.510.534:551.508.952(52)

Sekiguti, R., **Tentative calculation of the amount of ozone in the earth's upper atmosphere om the observation of the ultraviolet solar radiation made on the summit of Mt. Fuji.** *Meteoro-gical Society of Japan, Tokyo, Journal*, 2nd Ser., 1(4):145–164, April **1933.** 10 tables, 9 figs., foot-fs. **DLC** (Orientalia)—In the present paper the author proposes a simple method for the de-rmination of the amount of ozone in the upper atmosphere. It is nothing other than GÖTZ's assical method and consists in observing galvanometer deflections caused when exposed to the lar radiation with and without filter. The ratio R, of the two successive exposures gives the nount of ozone, *s*, with the aid of a system of *s*-contours in (R-secz) plane. The effects of am-guity in the characteristic factors of various parts of the instrument are discussed. A tentative eans of finding a correction factor is proposed. A program for this work is being carried out on t. Fuji, 3730 m above sea level. Some 50 sets of observations were made on 15 days distributed er the period extending from Oct. 1932 to Jan. 1933. The value of *s* came out 0.32 cm (NPT), the mean showing a general tendency of increasing towards the midwinter. A possible relation of to the weather type is reserved for a future discussion, but the author suggests the importance of nsidering the effect of scattered cloud layer attending cyclonic systems. *Subject Headings:* **1. Ozone easurement techniques 2. Ozone-cloudiness relationships 3. Mt. Fuji, Japan.**—*From author's stract.*

10E–21 551.510.534:551.508.952(988)

Dauvillier, A., **Recherches sur l'ozone atmosphérique effectuées au Scoresby Sund pendant nneé polaire.** [Research on atmospheric ozone at Scoresby Sound during the Polar Year.] *urnal de Physique et le Radium*, Paris, Ser. 7, 5(9):455–462, Sept. **1934.** 4 figs., foot-refs. **DLC**—esults of 251 measurements of ozone made at Scoresby Sound (1932–1933) by means of a chemical ethod (described and illustrated) are presented graphically. An unusual increase of surface ozone the beginning of the Polar night is noted, with the highest maximum (57 mg/100 m^3) ever observed any place, which is 30 times larger than at the latitude of France. Normal ozone values are again bserved as soon as the troposphere is illuminated by the sun. The author believes that only the roral theory can account for the phenomena observed. *Subject Headings:* **1. Ozone in Arctic Chemical ozone determination 3. Scoresby Sound, Greenland.**—*G.T.*

1935–1939

10E–22 551.510.534:551.508.952(485)

Barbier, Daniel; Chalonge, Daniel and Vassy, Etienne, **Mesure de l'épaisseur réduite de l'ozone mosphérique pendant l'hiver polaire.** [Measurements of the reduced thickness of atmospheric one during the polar winter.] *Académie des Sciences, Paris, Comptes Rendus*, 201(18):787–789, ct. 28, **1935.**—A method of stellar spectroscopy was used for ozone measurement at Abisko, Sweden 8°20′N) from Dec. 1934 to March 1935. Average amounts of reduced thickness (1 to 7 measure-ents a night) are tabulated for 26 nights. A comparison with air-mass data for the same period ppears to indicate that much larger amounts of ozone are found in Arctic air masses than in those iginating in lower latitudes. *Subject Headings:* **1. Ozone-air mass relationships 2. Stellar ectroscopy 3. Spectroscopic ozone measurement 4. Ozone in Arctic 5. Abisko, Sweden.**—*G.T.*

10E–23 551.510.534

Meetham, A. R. and Dobson, G. M. B., **The vertical distribution of atmospheric ozone on the gh altitudes.** *Royal Society of London, Proceedings, Ser. A*, 148(865):598–603, Feb. 15, **1935.** tables, 2 figs., refs. **DLC**—Observations to determine the vertical distribution of ozone in the mosphere—similar to those recently made at Arosa—have been carried out at Tromsö, N. Norway, May and June, 1934. They show that the average height of the ozone is very slightly lower at e higher latitude, and indicate that at Tromsö the ozone is more concentrated in a region centered a height of 21 km above sea-level, whereas in Switzerland it is more uniformly distributed through e lower 30 km. *Subject Headings:* **1. Vertical ozone distribution 2. Ozone distribution at high itudes 3. Tromsö, Norway.**—*Authors' summary.*

10E–24 551.510.41:546.214:061.3 551.510.534

*Conference on Atmospheric Ozone, Oxford, Sept. 9–11, 1936, **Papers read at the Conference.** *yal Meteorological Society, Quarterly Journal*, Supplement to Vol. 62, **1936.** 76 p. figs., tables,

refs. **DLC**—Twenty-nine papers dealing with various aspects of atmospheric ozone are presen or summarized. The following subjects are covered: A) Methods of measurement (5 pape B) Vertical distribution (3), C) Absorption of radiation, and temperature of the upper atmosph (10), D) Horizontal distribution and weather conditions (5) and E) Photochemistry, etc. Extens literature citations are given and tables and diagrams presented throughout the reports read be this international gathering by investigators distinguished in their field. This collection may considered a thorough treatment of the status of ozone research at the time. (*Same item as* 6H May 1955, *MAB.*) *Subject Headings:* **1. Ozone conferences 2. Conference on Atmospheric Ozo Oxford, 1936.**—*G.T.*

10E–25 551.510.534:551.508.952(23

Konstantinova-Shlezinger, M., **Fluorestsentnyĭ metod opredeleniia soderzhaniia ozona vozdukhe.** [Fluorescent method of determination of the ozone content in air.] *Akademiia N SSSR, Komissiia po Izucheniiu Stratosfery, Trudy*, Vol. 2, pub. **1936.** p. 49–60. 3 figs., 3 tab English summary p. 60. Also: Rodionov, S.; Pavlova, E. and Stupnikov, N., **Izmerenie ko kovolnovogo kontsa solnechnogo spektra metodom shchetnika sveta.** [Measurement of the sh wave end of the solar spectrum by means of a light counter.] *Ibid.*, p. 61–88. 27 figs., 3 tab 13 refs., 13 eqs. English summary p. 88–89. Also: Balakov, V. V.; Vafiadi, V. G. and Krivich, S **Izmerenie kontsentratsii atmosfernogo ozona metodom pogloshcheniia ultrafioletovykh luc** [Measurement of ozone content by the ultraviolet absorption method.] *Ibid.*, p. 109–116. 4 f 10 refs., eqs. English summary p. 116. **DLC** (QC879.A6)—In the first paper, instrumentatio described and calculation given for ozone measurement made during analysis of the surface ai several different heights on Mt. Elbrus. In the second paper experimental data are presente graphic form to show systematically the results of optical measurements of ultraviolet band in solar spectrum during 1933 and 1934 at 2260, 3000 and 4250 m elevations on Mt. Elbrus in Caucasus. Diurnal variations in the region 2700 to 3100 Å indicated that at lower elevations curve is normal but at 3000 and 4250 m there is evidence of the presence of anomalous band 2600 Å and an anomalous maximum during the morning hours in the ordinary bands. The thick of the ozone layer in the atmosphere was calculated from the spectral energy curve according to Lambert-Bouguer method using α of FABRY and BUISSON. Although results are in agreement theory, evidence of certain anomalous conditions must be accepted with reservation. In the t paper measurements made at 2200 and 4500 m by photographing the spectrum of mercury wi quartz prism are reported. Instruments described and illustrated, and measurements at diffe elevations plotted on a scatter diagram. (*Same item as* 2.3–26, 2.3–43 and 2.4–93, March and A 1951, *MAB.*) *Subject Headings:* **1. Ultraviolet spectrum 2. Spectroscopic ozone measure 3. Ozonemeters 4. Elbrus Expedition, 1934–1935 5. Mt. Elbrus, U.S.S.R.**—*M.R.*

10E–26 551.510.534:551.5

O'Brien, Brian; Mohler, F. L. and Stewart, H. S., Jr., **Vertical distribution of ozone in atmosphere, Pt. 1** (by O'Brien), **Spectrographic results of 1934 flight.** *National Geographic Soc Contributed Technical Papers, Stratosphere Series*, 2:49–70, **1936.** 30 figs., 4 tables, 18 refs., 22 **Pt. 2** (O'Brien et al.), **Spectrographic results of 1935 flight.** *Ibid.*, p. 71–93. 37 figs., 10 **DWB.** Translation into Russian published Leningrad, Gidrometeoizdat., **1938.**—Pt. I opens wi review of 50 years of investigation of ozone. A detailed description of the two spectrographs (d sun and horizon skylight) carried on the flight of the Explorer I in 1934, methods used for meas ment of atmospheric ozone, procedure for reducing observations, photographic film and develop follows. Tables and figures give the results. The observations indicated that a marked inc in ozone concentration existed a short distance above the 18.5 km ceiling reached that year. P deals with the flight of Explorer II on Nov. 11, 1935, using similar instruments. This flight rea 22 km. Results are shown in figures and tables. *Subject Headings:* **1. Vertical ozone distribu 2. Ozone data 3. Stratosphere balloon ascents.**—*M.L.R.*

10E–27 551.510.534:54

Wulf, Oliver R. and Deming, Lola S., **The theoretical calculation of the distribution of ph chemically-formed ozone in the atmosphere.** *Terrestrial Magnetism and Atmospheric Electr* 41(3):299–310, Sept. **1936.** 3 figs., table, refs., 14 eqs. Also their: **The effect of solar radi on the calculated distribution of atmospheric ozone.** *Ibid.*, 41(4):375–378, Dec. **1936.** fig., t Also their: **The distribution of atmospheric ozone in equilibrium with solar radiation and the of maintenance of the distribution.** *Ibid.*, 42(2):195–202, June **1937.** figs., foot-refs., eqs. **DL** In the first paper an expression is derived for the distribution with height of atmospheric o assuming it to exist in an undisturbed photochemical steady state under the influence of solar r tion considered as that of a black body at a temperature of 6000°K. The distribution of ozo obtained resembles rather closely that which from observation is now known to be approxim the case. The characteristics of this distribution depend essentially on the distribution o

mospheric constituents and the character of the oxygen-ozone absorption coefficient curve. Cer-in factors not taken into account in the calculations described in the first paper: 1) influence of the osorption of ozone in the visible spectrum (the Chappuis bands) and 2) influence of air movements n the amount of ozone over any particular point on the earth's surface are the subjects of the remain-g papers. (For fuller abstract on Pt. 1, *see* 6E–10, May 1955, *MAB.*) *Subject Headings:* **1. Photo-emical theory of ozone 2. Ozone distribution 3. Radiation effects on ozone distribution.**—*uthors' abstract and M.L.R.*

10E–28 551.510.534:535.243

*Lejay, Pierre, **Mesures de la quantité d'ozone contenue dans l'atmosphère à l'Observatoire e Zô-Sè, 1934, 1935, 1936 (et) Les variations de l'ozone et les situations météorologiques.** *Zi-Ka-'ei, China. Observatoire, Notes de Météorologie Physique*, No. 7, **1937.** 16 p. 4 figs., 12 charts, tables, ref. **DWB** (M(08) Z68n)—Data obtained by Dobson's method at Zô-Sè Observatory (25 n W.S.W. of Shanghai (lat. 31°5′48″N) during 1934–36 are tabulated and analyzed graphically ith respect to pressure and 12 large synoptic charts presented for the Far East to show the monsoonal tuations which resulted in the maximum (8 charts) and in the minimum (4 charts) values of O_3 nticyclonic or polar and cyclonic or tropical air masses, respectively). Observations were made ear 11 a.m. daily when the sun was visible. Series were run on some days when the weather was the est for calibration purposes. Summaries of data for 1932–1936 by months are also given and scussed; maximum occurs in February–March and minimum in November. *Subject Headings:* **Ozone data 2. Dobson spectrophotometer 3. Ozone-synoptic relationships 4. Zô-Sè Observa-ry, China.**—*M.R.*

10E–29 551.510.534

Gauzit, J., **L'ozone atmosphérique.** [Atmospheric ozone.] *La Météorologie*, Paris, March/pril **1938.** p. 78–96. 9 figs., 9 refs. **DWB**—A review of knowledge (up to the date of publication) atmospheric ozone, beginning with CORNU (1881), HARTLEY (1881), FABRY and BUISSON (1913 nd 1921) and the discovery of the intense absorption bands in the UV, and methods used by the tter and by more recent workers and, finally, the results of measurements with respect to variations different seasons at different stations, latitudes and types of weather. Finally, the vertical dis-ibution of ozone and conclusions regarding the temperature of the high atmosphere are analyzed. harts show time, height, latitude, and air-mass variations. *Subject Heading:* **1. Ozone.**—*M.R.*

10E–30 551.510.534

†Götz, F. W. Paul, **Die vertikale Verteilung des atmosphärischen Ozons.** [Vertical distribution atmospheric ozone.] *Ergebnisse der Kosmischen Physik*, Leipzig, 3:253–325, **1938.** 51 figs., tables, 63 eqs., bibliog. p. 318–325 (items 123–318, in continuation of 1931 bibliog. *See* 10E–15). **LC**—After a brief introduction (Pt. I), progress in study of the vertical distribution of atmospheric one since 1931 is thoroughly and systematically reviewed under the following headings in Pt. II: easurement and calculation of absorption coefficient in UV, in visible bands, oxygen absorption efficient; new photographic instruments, Dobson photoelectric spectral photometer counters, sual and chemical methods. In Pt. III: the determination of surface ozone, ozone in mountains, terminations from Umkehr effect, records made with balloons, the Explorer I and II balloon cents. In Pt. IV: theories of vertical O_3 distribution, photochemical balance theory (CHAPMAN), ECKE's photochemical theory, WULF and DEMING's balance theory, JAUMOTTE's diffusion theory. Pt. V: consequences of the O_3 distribution for UV penetration, for high atmospheric temperature 0–50 km) relationship between O_3 and weather, etc. The excellent bibliography and photos of uipment, records, spectrograms and statistical presentations in tabular and graphic form provide wealth of background information and data for the period 1931–1938. *Subject Heading:* **1. Vertical one distribution.**—*M.R.*

10E–31 551.510.534

Haurwitz, B., **Atmospheric ozone as a constituent of the atmosphere.** *American Meteorological ciety, Bulletin*, 19(10):417–424, Dec. **1938.** fig., table, 16 refs. **DWB, DLC**—Discusses relation-ip between ozone and meteorological elements such as atmospheric pressure and temperature with ference to the work of DOBSON and HARRISON (1926), MEETHAM (1937), and others; ozone and mospheric variations in the layers between 10 and 30 km, etc. Author advocates simultaneous servations of the vertical distribution in order to better understand ozone-meteorological variable lationships. A table presents correlation coefficients between ozone and meteorological elements urface pressure, upper air observations, surface pressure distribution).—*Subject Headings:* **1. Ozone-eather relationships.**—*M.L.R.*

10E–32 551.510.41:546.214:551.515

Auer, R., **Über den täglichen Gang des Ozongehalts der bodennahen Luft.** [Daily variations ozone content in the air near the ground.] *Beiträge zur Geophysik*, Leipzig, 54(2):137–145, **1939.**

6 figs., refs. **DLC**—A refinement of the chemical method of ozone determination was developed V. H. REGENER, making it possible to obtain ozone values within ½ hour and consequently to vestigate diurnal variations of surface ozone content. In this paper, data on ozone variations dur various weather situations (high pressure with little wind; strong surface wind, fog, föhn, etc.) presented and discussed. Ozone is found to persist near the ground only as long as there is turbule which carries it down from higher layers. *Subject Headings:* **1. Diurnal ozone variations 2. Chemi ozone determination 3. Ozone-weather relationships.**—*G.T.*

10E–33 551.506:551.510.534(54

*Chiplonkar, M. W., **Measurements of atmospheric ozone at Bombay.** *Indian Academy Science, Proceedings*, 10(3):105–120, Sept. **1939.** tables, 3 figs., 9 refs. **DLC**—Observations w made at Colaba Observatory from Oct. 1936 to Sept. 1938 using a Dobson spectrograph. "T annual mean amount of ozone at Bombay is 0.213 cm at NTP." The annual variation show maximum in April–May and a minimum in Nov.–Dec. Some unknown factor makes the val abnormally small on some of the days in the monsoon months July and Aug. Correlation betw daily value of ozone and pressure at ground level is very slight. *Subject Headings:* **1. Ozone d 2. Annual ozone variations 3. Bombay, India.**—*M.L.R.*

10E–34 551.510.534:551.521.17:551.5

Coblentz, W. W. and Stair, R., **Distribution of ozone in the stratosphere.** *U. S. Natio Bureau of Standards, Journal of Research*, 22:573–606, **1939.** table, 14 figs., 30 refs. **DLC** (QC1.U —Discusses measurements of ultraviolet solar radiation intensities at a fixed ground station at a h elevation (Flagstaff, Ariz., elev. 2.2 km) in June, 1938. In four balloon ascensions, the photoelec ultraviolet-intensity meter and auxiliary radio-transmitting apparatus obtained heights of 83, to 88,000 ft (25 to 27 km), penetrating about 65% of the ozone, the most of which was localized i layer extending from an elevation of 18 to 27 km, with a wide maximum concentration at a heigh about 25 km. At the highest elevation attained by the instruments, the intensity of the ultravi of short wave lengths was about 10 times that of direct sunlight at sea level. *Subject Headir* **1. Ultraviolet absorption 2. Ozone data 3. Vertical ozone distribution 4. Stratosphere balll ascents 5. Flagstaff, Ariz.**—*Authors' abstract.*

1941–1944

10E–35 551.510.534:551.52

†Vassy, Arlette, **Sur l'absorption atmosphérique dans l'ultraviolet.** [Atmospheric absorptio the ultraviolet.] Paris, Masson, **1941.** Thesis (Ph.D.)—Faculté des Sciences, Univ. de Pa 61 p. 16 figs., 7 tables, 54 refs. **DLC** (QC911.V35)—Ozone absorption coefficients measured un laboratory and natural conditions (Mont-Ventoux) are tabulated and the method and results discussed. Spectra photometric photography was used in with a hydrogen tube as a heat sou The values obtained are compared with those of other investigators. Spectral distribution of s radiation energy is calculated for different altitudes up to 50 km. *Subject Headings:* **1. Oz absorption coefficients 2. Ultraviolet absorption 3. Mont-Ventoux, France.**—*G.T.*

10E–36 551.510.534:551.52

*Barbier, D. and Chalonge, D., **Sur les coefficients d'absorption de l'ozone dans la région bandes de Huggins.** [Absorption coefficients of ozone in the region of Huggins bands.] *Ann de Physique*, Paris, Ser. 11, 17:272–302, **1942.** 16 figs., 7 tables, 14 refs. **DLC**—A thorough detailed report on measurements made with great accuracy of the coefficients of absorption o for wave lengths from 3439 to 3130 Å, and for temps. of −95°, −50°, −30°, +18°, +65° and +9 The equipment used in the laboratory experiments, methods of obtaining low and high temperat (using dry ice for low temperatures), method of measuring the temperature and of calibrat photographic photometer techniques and detailed results are discussed and the data given in tensive tables and curves—causes of errors (light source, pressure, foreign gas, etc.), and applicat to geophysical and astrophysical studies are also considered. Curves of coefficients vary p bolically with temperature and are independent of pressure. *Subject Headings:* **1. Ozone absorp coefficients 2. Huggins bands.**—*M.R.*

10E–37 551.510

Shaw, Sir William Napier, **The controlling influences of radiation.** (In his: *Manual of Me ology*, pub. Cambridge, University Press, **1942.** Vol. 3:171–204. figs., foot-refs.) **DWB** section of this chapter is devoted to ozone in atmospheric structure (p. 182–187). Treats natu ozone, life history, G. M. B. DOBSON's study of the relation between weather and variation radiation and resulting world-wide program of investigation, methods of investigation, forma and height of ozone, relationship of ozone to surface pressure and pressure at base of stratospl etc. *Subject Heading:* **1. Ozone.**—*M.L.R.*

10E–38 551.510.534:541.14

Chapman, Sydney, **The photochemistry of atmospheric oxygen.** *Physical Society of London, ports on Progress in Physics*, 9:92–100, 1942/43, pub. **1943.** refs., 22 eqs. **DLC**—Reviews photo- mical ozone theories of CHAPMAN, MECKE and WULF-DEMING. The theories reviewed concern otolysis by the absorption of sunlight, photochemical equilibrium and daily, seasonal and alti- inal variations of ozone density. *Subject Headings:* **1. Photochemical theory of ozone 2. Ozone tochemistry 3. Ozone density variations.**—*G.T.*

10E–39 551.510.41:546.214:551.515

Glueckauf, E., **The ozone content of the surface air and its relation to some meteorological ditions.** *Royal Meteorological Society, Quarterly Journal*, 70(303):13–21, Jan. **1944.** 3 figs., ables, refs. **DWB**—The variations of the ozone content of surface air during depressions have n investigated. Three definite conditions were found to occur, apparently without exception. lrop in the ozone content is found up to 300 mi in advance of warm fronts, with high values of ne after their passage. An occluded front of the warm front type behaved in exactly the same / as a front with a warm sector. A drop in the ozone content is found after the passage of back- t occlusions, persisting until the front has moved up to 200 mi, after which the ozone returns ts normal concentration. This seems to indicate that the observed change under these conditions he ozone content is due to the increased stability of air not at the surface but at the upper warm nt inversion. This would prevent the ozone (constantly restored near the ground) from being ored by turbulent interchange with air from greater heights. *Subject Heading:* **1. Ozone-weather tionships.**—*Author's summary.*

1945–1949

10E–40 551.510.534:551.515

†Nicolet, Marcel, **L'ozone et ses relations avec la situation atmosphérique.** [Ozone and its tion to the atmospheric situation.] *Belgium. Institut Royal Météorologique, Miscellanées, No.* **1945.** 36 p. 7 figs., table, 59 eqs., bibliog. p. 34–36. **DLC** (QC881.N5)—After a detailed review the photochemical theory of ozone formation, equilibrium, vertical distribution and periodic iations, the author discusses nonperiodic ozone variations due to atmospheric disturbances and ws that the reduced thickness of ozone increases with the lowering of the tropopause diurnal lonic situations, and decreases with the rising of the tropopause during anticyclones. *Subject adings:* **1. Ozone-cyclone relationships 2. Photochemical theory of ozone.**—*G.T.*

10E–41 551.510.53:551.521.1

Dobson, G. M. B.; Brewer, A. W. and Cwilong, B. M., **Meteorology of the lower stratosphere.** *yal Society of London, Proceedings, Ser. A*, 185(1001):144–175, Feb. 12, **1946.** 18 figs., 15 refs. **C.** Transl. into Russian in *Uspekhi Fizicheskikh Nauk*, 31(1):96–128, **1947.**—In this monumental k on the water vapor, ozone and CO_2 in the upper atmosphere, their influence on radiation balance hence on temperature and height of tropopause, etc., the authors present numerous charts and phs to show the quantitative relationships of the elements with height, time and synoptic condi- ns. Many individual soundings are shown as well as mean conditions over England. The tive importance of the various gases are considered and, finally, the three questions posed by PSON (1928) regarding the tropopause are tentatively answered on the basis of ratio of H_2O = vapor O_3 and turbulent mixing. (*Same item as* 5D–129, April 1954, *MAB.*) *Subject Headings:* **Stratospheric composition 2. Radiation balance 3. Tropopause height 4. Tropopause tem- atures 5. Ozone.**—*M.R.*

10E–42 551.510.534:541.14

Dütsch, Hans Ulrich, **Photochemische Theorie des atmosphärischen Ozons unter Berück- tigung von Nichtgleichgewichts-Zuständen und Luftbewegungen.** [Photochemical theory of ospheric ozone with consideration of non-equilibrium conditions and of air movements.] Zürich, **6.** 113 p. 8 figs., 36 tables, eqs., refs. Thesis (Ph.D.)—Univ. of Zürich. **DLC** (QC881.D8)— general distribution of ozone in the atmosphere, current theories on photochemical O_3 balance, ories of O_3 formation and destruction, units, calculation of vertical O_3 distribution, calculation ther methods of spectral radiation distribution, etc., influence of sun angle on O_3 balance, non- ilibrium under radiative influences, influence of currents, turbulent exchange and diffusion, ical and seasonal O_3 regime in different latitudes, annual O_3 cycle assuming a meridional circula- , O_3 and weather, and conclusions. A great deal of data is presented in tabular and graphic ss sections and nomograms) form. *Subject Headings:* **1. Ozone monographs 2. Ozone-atmos- ric circulation relationships 3. Photochemical equilibrium of ozone.**—*M.R.*

10E–43 551.510.534:551.524.7

Gowan, E. H., **Ozonosphere temperatures under radiation equilibrium.** *Royal Society of don, Proceedings, Ser. A*, 190(1021):219–226, July **1947.** 2 figs., 2 tables, refs. Also his: **Night**

cooling of the ozonosphere. *Ibid.*, p. 227–231. tables, fig., refs. **DLC**—In calculating the oz sphere temperatures under radiation equilibrium, the author has made use of new data, for lat. 5 Data on quantities, absorptions, and on energy entering the ozonosphere are given and their re tabulated. The results generally indicate that absorption of solar radiation by ozone will exp the existence of high temperatures around 35–50 km, though the ozone maximum is at 22 *Subject Heading:* **1. Ozonosphere temperatures.**—*R.P.*

10E–44 551.510

Penndorf, R., **Der Ozongehalt der mittleren Stratosphäre.** [The ozone content of the mi stratosphere.] *Zeitschrift für Meteorologie*, 1:345–357, **1947.** 9 figs., 4 tables, 20 refs., 32 **DWB**—The optical upper boundary of the Ozone layer at sunset and its calculation from gra rays and from vertical measurements, the influence of Rayleigh scattering, "ozone twilight," cal tion of the upper optical boundary of the O_3 layer by the decrease in intensity of sodium ligh twilight, theoretical calculations from zenith measurements, eclipse measurements, etc. are wo out theoretically and empirically by geometrical and other graphical or statistical means. *Su Headings:* **1. Ozone height determination 2. Ozone layer.**—*M.R.*

10E–45 551.510.534:551.5

Penndorf, R., **Effects of the ozone shadow.** *Journal of Meteorology*, 5(4):152–160, 1 9 figs., 5 tables, 11 refs., 12 eqs. **DLC**—The radius of the earth's shadow for ultraviolet sunlig enlarged by an amount equal to the altitude of the upper boundary of the ozone layer. Amon effects of this ozone shadow are (1) a delay in ionization at sunrise in the ionosphere, from whic uppermost height of the ozone layer may be calculated, (2) variations in the intensity of ultrav light reflected from the moon during a lunar eclipse, furnishing information concerning the ver distribution of ozone, and (3) a premature decay in the intensity of the sodium D-line at su leading to calculation of the height of emission of the D-line. *Subject Heading:* **1. Ozone shado** *Author's abstract.*

10E–46 551.508.952:551.5

†Stranz, Dietrich, **Ozonradiosonde.** [Ozone radiosonde.] *Göteborg, Sweden. Cha Tekniska Högskola, Handlingar*, No. 72, **1948.** 48 p. 18 figs., 5 tables, 33 refs., 19 eqs. (*Re from Research Laboratory of Electronics*, No. 6.) **DWB**—An ozone radiosonde is described illustrated for measurement of ozone content of the atmosphere up to 25 km or thereabouts actually sends to the ground receiver signals which vary with the amount of UV radiation rec on a Cd photocell. Methods of converting the data, as well as functioning and developme equipment are treated in theory and from practice. *Subject Heading:* **1. Ozonesonde.**—*M.R.*

10E–47 551.510.534:551.

Adel, Arthur (*Univ. of Mich.*), **Effective radiation temperatures of the ozonosphere over Mexico.** *U. S. Air Force. Geophysical Research Center, Geophysical Research Papers*, No. 2, **1949.** 31 p. 7 figs., 12 tables, 15 refs. **DWB**—Effective radiation temperatures of the ozonosp were determined near Alamogordo, New Mexico, for 51 days and 5 nights between March 23 July 15, 1948. A total of 138 independent sets of daytime data were obtained. Analysis of data showed that there was no marked diurnal effect. The effective radiation temperature, i neighborhood of −40°C, was essentially the same for both day and night. Observations show systematic connection between water vapor content of the atmosphere and effective radiation perature of the ozonosphere. There was no marked effect of the amount of ozone (or of any atmospheric constituent) in the radiation path of the obtained temperature values, except for low altitude of the sun or moon, which resulted in a raising of the values. It was found tha ozonosphere radiation near zenith at 9.57 microns did not change in a pronounced way durin sunrise or sunset periods. (*Same item as* 7.3–144, March 1956, *MAB.*) *Subject Headings:* **1 fective radiation temperature 2. Ozonosphere temperatures 3. New Mexico.**—*Author's abst*

10E–48 551.510.53

*†Germany. Deutscher Wetterdienst in der US-Zone, **Ozon.** [Ozone.] Its *Berichte*, No **1949.** numerous figs., tables and refs.—This issue of the Berichte contains ten papers delivered symposium of German scientists held at Tharandt in April 1944. They deal with all aspects of research, such as instrumentation, photochemical theory, vertical and horizontal distribution, re to meteorological and geophysical phenomena, etc. etc. To these are added 4 other papers had been published in 1941 for limited distribution. One of these is by E. REGENER on the layer and atmospheric turbulence, a thorough review of the problem with 103 references. The 3 are by A. and H. EHMERT, on daily variations of surface ozone, ozone amounts during high-pre situations in winter and chemical ozone determination. (For complete listing of contents, *see* May 1950, *MAB.*) *Subject Headings:* **1. Ozone symposia 2. Ozone layer 3. Ozone meters.**—

10E–49 551.510.534(54)

Karandikar, R. V. and Ramanathan, K. R., **Vertical distribution of atmospheric ozone in low tudes.** *Indian Academy of Sciences, Proceedings, Sec. A*, 29(5):330–348, May **1949.** 6 tables, gs., 18 refs. **DLC**—Observations of the light scattered from the clear blue zenith sky were made h Dobson's photoelectric spectrophotometer at Delhi (28°35'N) and Poona (18°31'N) during the iods Nov. 1945 to March 1947 and Feb.-March 1948, and these have been used to determine the ght distributions of ozone at these places. . . . Distributions of ozone are given for total ozone ounts varying from 0.155 cm to 0.217 cm at Delhi, the average heights of ozone for these being n 26.3 km to 25.1 km. A decrease in the total ozone amount is found to cause a rise in the center gravity. At Poona, distributions for ozone amounts 0.163 cm and 0.174 cm give a more or less d height of 28.0 for the center of gravity. *Subject Headings:* **1. Vertical ozone distribution Ozone data 3. India.**—*From authors' summary.*

10E–50 551.510.534:523.38

Penndorf, Rudolf, **Über die Ermittlung der vertikalen Ozonverteilung bei Mondfinsternissen.** etermination of the vertical ozone distribution during lunar eclipses.] *Leipzig. Universität. physikalisches Institut, Veröffentlichungen, Ser.* 2, 15:171–178, **1949.** 2 figs., table, 8 refs., 2 eqs. **VB**—The vertical distribution of ozone in the earth's atmosphere from 5 to 50 km is presented and cussed. Measurements of the intensity of sunlight reflected from the moon, just before a lunar pse and in the edges of the shadow, show the amount of absorption of certain wave lengths due ozone in the earth's atmosphere at certain heights. Curves of Götz showing single and double xima compared with author's measurements for 40–50 km. (*Same item as* 2.4–55, April 1951, *AB.*) *Subject Headings:* **1. Vertical ozone distribution 2. Ozone layer 3. Lunar eclipses.**—*R.*

10E–51 551.510.534(789)

*†Stair, Ralph, **Measurement of ozone over Organ Mountains, New Mexico.** *U. S. National reau of Standards, Journal of Research*, 40(1):9–19, Jan. **1948.** 8 figs., 2 tables, 23 refs. Also his: **nter measurements of ozone over Organ Mountains, New Mexico.** *Ibid.*, 42(2):145–152, Feb. **19.** table, 8 figs., 22 refs.—Data on total amount of ozone measured near White Sands, N. Mex. ween June 29 and July 4, 1947 (first paper) and Dec. 16 to 19, 1947 and Jan. 6 to 8, 1948 (second per). Equipment and observational methods described and illustrated. (For fuller abstracts, *American Meteorological Society, Bulletin*, 29(8):456, Nov. **1948,** item 47–14, and 2–63, Feb. 50, *MAB.*) *Subject Headings:* **1. Ozone data 2. White Sands, N. Mex.**—*M.L.R.*

10E–52 551.510.534(753)

*†Stair, Ralph, **Seasonal variation of ozone at Washington, D. C.** *U. S. National Bureau of ndards, Journal of Research*, 43(3):209–220, Sept. **1949.** 12 figs., 45 refs. **DLC**—This paper es data on the variation in the total amount of ozone in the atmosphere above Washington, D. C., ering a 9-yr period extending from 1934 to 1943. The amount of ozone was determined from ar ultraviolet measurements made by means of a phototube and filter method on direct sunlight. e ozone determinations indicate a seasonal variation having a maximum value during late winter d early spring (range 0.20 to 0.30 cm normal-temp. pressure) with a minimum value in late summer early fall (range 0.16 to 0.20 cm normal-temp. pressure). No correlation appears to exist between al ozone value and surface pressure pattern or between ozone value and sunspot number. A close relation does, however, exist between total ozone and air temp. at altitudes near 8 km, that is, hin the upper part of the troposphere. A slight opposite correlation appears to hold for altitudes hin the stratosphere, with the change-over occurring near the level of the tropopause. *Subject adings:* **1. Seasonal ozone variation 2. Washington, D. C.**—*Author's abstract.*

10E–53 551.510.534:541.14

†*Craig, Richard A., **The observations and photochemistry of atmospheric ozone and their me- rological significance.** *American Meteorological Society, Meteorological Monographs*, 1(2), Sept. **50.** 50 p. 18 figs., 4 tables, 119 refs., append. (with 36 tables and eqs.). **DWB**—One of the st comprehensive treatments of the problem of ozone in the free atmosphere. After a brief tory of significant research there is a thorough discussion and analysis of observational data with pect to latitude, season, altitude, temperature, air mass and frontal conditions and year. Varia- ns in solar altitude, solar constant, temperature, etc. on the ozone concentration and photo- mistry of the ozone layer are treated next. Then the causes of daily, seasonal and annual varia- n are considered. Lastly, there is a thorough bibliography and appendix containing a large ount of data gathered in various parts of the world, and constants derived therefrom. (*Same n as* 2.1–67, Jan. 1951, *MAB.*) *Subject Headings:* **1. Ozone monographs 2. Ozone variations Photochemical equilibrium of ozone.**—*M.R.*

10E–54 551.510.534:551.506.7 (0

Dobson, G. M. B., **Ozone.** *International Union of Geodesy and Geophysics, Associatio Meteorology, Oslo,* 1948, *Procès-Verbaux,* 3:138–142, Nov. **1950. DWB**—Discusses ozone su projected in 1946 by the I.U.G.G. but interrupted by the war. Nineteen ozone spectrometers checked and calibrated at Oxford in 1937–39, and distributed to European stations. Results obtained for Lerwick, Aberdeen, Eskdalemuir, Oxford and Valencia. Results of studies mad ozone changes at fronts, in thunderstorms, annual variation, vertical distribution and improve in instrumental techniques. Future work outlined is reported. Ozone content falls ahead of w front and rises after cold front passages rises during thunderstorms, and is highest in spring and lo in Dec. (*Same item as* 4.4–89, April 1953, *MAB.*) *Subject Headings:* **1. Ozone research 2. O networks 3. Annual ozone variations 4. Ozone meters 5. Europe.**—*M.R.*

10E–55 551.510.534:551.

Dütsch, H. U., **Der Einfluss der Temperatur auf das atmosphärische Ozon.** [Influenc temperature on atmospheric ozone.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Se* 2(4):386–400, **1950.** 4 tables, 18 refs., 18 eqs. English and French summaries p. 386–387. **DW** Author investigated the theory of A. and E. Vassy that the total amount of ozone in the atmosp depends on the temperature at 30 km and the total incoming solar energy. Basing his calcula on the photochemical theory, he finds that the Vassys' empirical formula greatly overestimate total amount of ozone, and also the influence of the seasonal changes in the height of the sun. (*item as* 2.2–50, Feb. 1951, *MAB.*) *Subject Headings:* **1. Ozone layer 2. Upper air tempera —*C.E.P.B.***

10E–56 551.510.53

†Fabry, Charles, **L'ozone atmosphérique.** [Atmospheric ozone.] Paris, Centre Nation la Recherche Scientifique, **1950.** 278 p. 75 diagrs., tables, 155 refs., eqs. Biographical p. 3–5. **DLC** (QC881.F3)—A comprehensive treatment of every aspect of atmospheric ozone i light of present theoretical and empirical knowledge. The first chapter deals with progress in field during the past 200 yrs. Following chapters take up the concentration of ozone in the at phere, absorption of radiation, optical properties, methods of observation, spectroscopy, distribu with height, radiosonde measurements, determination of the temperature of ozone layers in st sphere, effect on organisms, theory of dissociation of oxygen, and finally the variation of ozone air masses, magnetic storms, etc. An excellent list of references is appended. (*Same ite* 3.8–71, August 1952, *MAB.*) *Subject Headings:* **1. Ozone research 2. Ozone textbooks.**—*M.*

10E–57 551.510.534

*†Fritz, Sigmund and Stevens, Gene C., **Atmospheric ozone at Washington, D. C.** *Mo Weather Review,* 78(8):135–147, Aug. **1950.** 10 figs., 2 tables, 23 refs., 3 eqs. **DWB**—Base data obtained since Feb. 1948 by the U. S. Weather Bureau at Washington, D. C., with a Do ozone spectrophotometer, the annual variability in ozone is determined and found to be no The distribution of ozone around surface pressure systems is examined. It was found tha distribution around *lows* was normal but around *highs* different from results obtained in places.* Amount of ozone in relation to upper air temperature and wind (500 and 100 mb le is discussed and an explanation of the spring maximum and summer minimum suggested as d advection or vertical motion as well as annual variation in amount of ozone. Characteristics c possible errors in instruments and observations discussed. Daily data presented in tables scatter diagrams. (*Same item as* 2.2–49, Feb. 1951, *MAB.*) *Subject Headings:* **1. Annual variations 2. Washington, D. C.**—*M.R.*

10E–58 551.508.952 551.513:54

Gabites, J. F., **Ozone and the atmospheric circulation.** *New Zealand. Meteorological Circular Note,* No. 67, Nov. 14, **1950.** 5 p. fig., 9 refs. **DWB**—The author discusses the w which the photoelectric spectrometer is used to determine atmospheric ozone, the formati ozone, the distribution of ozone in the atmosphere, and its use as an indicator of atmospheric m to study the circulation of the atmosphere. A program of ozone observations in New Zeala outlined. *Subject Headings:* **1. Photoelectric spectrometers 2. Ozone-atmospheric circu relationships.**—*I.L.D.*

10E–59 551.510.534:551.

Maeda, K., **On the Umkehr effect in zenith-scattered sunlight and the vertical distribut ozone in the atmosphere.** *Geophysical Magazine,* Tokyo, 21(4):343–355, Aug. **1950.** 4 3 tables, 6 refs., 14 eqs. **DWB, DLC**—The Umkehr (reversal) or Götz effect is that light fro zenith sky is relatively richer in UV when sun is near horizon than when it is a few degree Author calculates scattering in standard atmosphere with ozone distribution according to

waves of 3110 and 3290 Å for solar zenith distances 70–88° and finds that primary scattering by ne alone is not sufficient. (*Same item as* 2.10–98, Oct. 1951, *MAB.*) *Subject Headings:* **1. Um- r effect 2. Scattering of light 3. Vertical ozone distribution.**—*C.E.P.B.*

10E–60 551.510.41:551.510.534

Malurkar, S. L., **Photolysis of atmospheric ozone in presence of water vapour.** *Science and ture*, 16(2):70–72, Aug. **1950.** 10 refs., eqs. **DLC**—The author discusses the theoretical and erimental evidence for the photolysis of ozone under the influence of water vapor and ultraviolet iation. A possible series of reactions for the photolysis of ozone combining H_2O is suggested, nely:

$$O_3+H_2O+h\nu=O_2+H_2O_2; \quad h\nu+H_2O_2\rightarrow 2OH$$
$$2H_2O_2+h\nu=2H_2O+O_2$$

ess probable alternative is the following reaction:

$$h\nu+H_2O_2=H_2O+O$$

me item as 2.4–47, April 1951, *MAB.*) *Subject Headings:* **1. Atmospheric composition 2. Ozone otolysis.**—*I.L.D.*

10E–61 551.510.534:541.14

Miyake, Y. and Saruhashi, K., **A photochemical theory on the formation of the ozone layer in atmosphere.** *Geophysical Magazine*, Tokyo, 21(2):99–107, March **1950.** 6 figs., 7 refs., 33 eqs. **VB, DLC**—The photochemical theories of the formation of ozone in the atmosphere proposed by APMAN, WULF-DEMING and NICOLET are inadequate as light with wave length less than 1750 Å, ich dissociates oxygen molecules into atoms is absorbed at an altitude of 80 km and the absorption fficients in the Herzberg region are very small. The authors modify MECKE's reactions of nation and dissociation of ozone by postulating a third molecule an atom to which heat is trans- ed. The fundamental equation of photochemical equilibrium differs from MECKE's in that the at absorption coefficient of oxygen and ozone are calculated by integrating over each effective ge of wave length. The altitudinal distribution of ozone calculated by the theoretical assump- ns are in good agreement with observational data. (*Same item as* 10.52, Oct. 1950, *MAB.*) *oject Heading:* **1. Photochemical theory of ozone.**—*I.L.D.*

10E–62 551.508.95:551.507.321

National Research Corporation, Cambridge, Mass., **Balloon-borne air-sampling device.** Con- ct AF-19(122)-90, Reports No. 1–4, Sept. 15, 1949–Sept. 8, **1950.** 4 pieces. figs., refs., eqs. **VB**—Purpose of the project, completely covered by this final series of four quarterly reports, s to develop an air sampling bottle for collecting upper-air nitrogen, oxygen, argon, carbon dioxide, n, helium, krypton, hydrogen, xenon, ozone and radon. The work comprised two separate ks: (1) Development of mechanical design and (2) investigation of adsorption qualities of inner faces of bottles (for pyrex glass and copper). As a result of this dual effort an automatic high- uracy, balloon-borne one-liter atmospheric sampling device was developed. The instrument and installation and operation are described in detail and shown in photographs and diagrams. Meth- and apparatus used during the research phase are also described and illustrated. *Subject Head- s:* **1. Air sampling instruments 2. Balloons 3. Atmospheric composition. I. Hall, Vincent C., II. Mellen, Glenn Z. III. Lawrence, Richard B.**—*G.T.*

10E–63 551.510.41:551.510.534

New Mexico. University, **Investigation in the physics of atmospheric ozone.** Contract 8-099 ac-379, Interim Reports, No. 1–11, covering Jan. 1, 1948–Sept. 30, **1950.** 11 pieces. ., refs. Also: **Report,** No. 12 (Final), Nov. 30, **1950.** 33 p. 4 figs., 15 refs. **DWB**—The first reports cover work done over a period of more than 2 years in the following fields: 1) Vertical tribution of temperature in relation to O_3 distribution, 2) amount of surface O_3, 3) technique for overy of balloon-borne instruments, 4) investigation of methods for detecting O_3 used in SW rmany, 5) vertical distribution of O_3 in troposphere and stratosphere, respectively, 6) development surface, balloon-borne, airborne and mountain peak O_3 measuring equipment of several types. oretical investigations were undertaken as well as the chemical and spectrographic measurements. res of line or wiring diagrams of equipment and graphs of resulting data are included. The Final port covers: 1) the vertical distribution of ozone in the atmosphere is investigated by means of rtz spectrographs attached to sounding balloons which reach heights of 30 to 32 km. Total kness of the ozone layer on four ascents is 0.33, 0.40 and 0.38 cm. No immediate relationship ween wind velocity and ozone thickness seen. 2) In the automatic and chemical determination of ospheric ozone a known quantity of sodium thiosulfate is added beforehand to several liters of assium iodide "change" solution. Air containing ozone is brought into close contact with a small

amount of the charge. The equipment for carrying out the measurement of ozone content is scribed by means of diagrams and the procedure is outlined in detail. The experimental sou of error are discussed. (*Same item as* 6.5–85, May 1955 and 3.7–81, July 1952, *MAB.*) *Su Headings:* **1. Ozone research 2. Ozone data.**—*M.R. and I.L.D.*

10E–64 551.510.41:551.510.534(

Penndorf, Rudolf, **The annual variation of the amount of ozone over northern Norway.** *Ann de Géophysique*, 6(1):4–9, Jan.–March **1950.** 3 figs., table, 4 refs. French and English summa p. 4. **DLC**—Normal daily ozone values and the interdiurnal variations of the amount of ozone been calculated for Tromsö, Norway. The annual variation of ozone E is analyzed. The i diurnal variation differs considerably between winter and summer; the standard deviation in is 9.5×10^{-3} cm. and in December 56×10^{-3} cm. In summer the equilibrium between ozone forma and dissociation is maintained more or less throughout most of the Northern Hemisphere so the differences of the vertical distribution are small and the interdiurnal variation is small. winter the vertical distribution is different over middle and high latitudes and so ozone is for over the polar region. Hence, advection determines the amount of ozone E. (*Same item as* 2.1 Jan. 1951, *MAB.*) *Subject Headings:* **1. Annual ozone variations 2. Tromsö, Norway.**—*M.R.*

10E–65 551.510.534:551

Penndorf, Rudolf, **Ozon und Wetter.** [Ozone and weather.] *Meteorologische Zeitsc* 61(7):231–235, July **1944.** 2 figs., 13 refs. Also his: **Ozon und Wetter, II.** *Meteorologische R schau*, 3(3/4):49–54, March/April **1950.** 3 figs., table, 12 charts. English summary p. 49. **DW** The various theories correlating ozone distribution with meteorological phenomena, such as su pressure, advection, turbulence, and cyclonic development are reviewed in the first part o article. In the second part the review is brought up to date and surface and 97 mb charts are sented for Europe (classified at the time of the first article's publication) for Feb. 15–20 and Aug. 1942, with ozone amounts at Tromsö, Aarhus and Arosa, and combined ozone charts relati low and high pressure centers. These show two air masses, a southerly one poor in ozone a northerly one rich in ozone. *Subject Headings:* **1. Ozone-weather relationships 2. Upper air w 3. Europe.**—*C.E.P.B., G.T.*

10E–66 551.510.534:551.521.1

Poliakova, E. A., **Spektrograficheskoe izuchenie prozrachnosti atmosfery dlia ul'trafiole radiatsii solntsa.** [Spectrographic observation of atmospheric transparency for solar ultra radiation.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, 19(81):185–192, 5 figs., 2 tables, 7 refs., eqs. **DLC**—Observations made at 3 different places in the U.S.S. widely different latitudes, are used to determine characteristics of the atmosphere with respe optical density of aerosols. The relation of such optical density to wave length from 3000 to 36 at Pavlovsk, Sevastopol and Matsesta is shown graphically for different amounts of O_3. (*item as* 2.7–100, July 1951, *MAB.*) *Subject Headings:* **1. Ultraviolet light 2. Atmospheric t parency 3. Ozone 4. U.S.S.R.**—*M.R.*

10E–67 551.510.534:551.593.5(5

*Ramanathan, K. R. and Karandikar, R. V., **Recent work on the measurement of atmosp ozone and its vertical distribution in India.** *I.U.G.G. Association of Terrestrial Magnetism Electricity, IATME Bulletin*, No. 13:492–494, **1950. DWB**—Observations of direct sunlight made with a Dobson photoelectric spectrophotometer at Delhi during Nov. 1945 to March and daily and monthly mean amounts of ozone calculated for the period. Measurement zenith scattered light intensity were taken in clear days at different seasons for various solar dist The Umkehr effect was evident. Vertical distribution of ozone was calculated and is indica a table for layers 0–9 km, 9–18, 18–27, 27–36, 36–45 and 45–54 km over Delhi for total ozon centration of 0.155, .175, .200 and .217 cm. Similar observations are to be made at Poon Kodaikanal. (*Same item as* 5.2–91, Feb. 1954, *MAB.*) *Subject Headings:* **1. Ozone concent 2. Vertical ozone distribution 3. Zenith scattered light intensity 4. Delhi, India.**—*M.R.*

10E–68 551.510.534:551.554:5

Reed, Richard J., **The role of vertical motions in ozone-weather relationships.** *Jour Meteorology*, 7(4):263–267, Aug. **1950.** 5 figs., 11 refs. **DWB**—The literature on the relati between daily fluctuations in ozone amount and weather conditions and temperature and pot temperature in tropopause and lower stratosphere is summarized. A method based on the co of ozone mixing ratio, for calculating the effect of atmospheric vertical motion on ozone fluctu is presented. It is shown that the vertical motions account for at most one third of the ra daily ozone amount variations and the remainder is produced by horizontal advection. The m in which vertical motion and horizontal advection operate to produce the ozone-weather relati

xplained. (*Same item as* 2.2–52, Feb. 1951, *MAB.*) *Subject Heading:* **1. Ozone-vertical motion ationships.**—*I.L.D.*

10E–69 551.510.534(43)

Regener, E.; Paetzold, H. K. and Pfotzar, G., **Weitere Bestimmung der vertikalen Ozon-teilung.** [Further determination of the vertical distribution of ozone.] *Die Naturwissenschaften*, (24):559–560, Dec. **1950. DLC**—Ozone distribution up to 30 km, as determined from a spec-graph made during a free balloon ascent at Weissenau on Feb. 18, 1950, is compared with earlier ent on June 26, 1934 at Stuttgart. A sharp max. appears at 22 km and 18 km respectively, on se two ascents. Agrees with V-2 ascents in the U. S. (*Same item as* 2.4–56, April 1951, *MAB.*) *bject Headings:* **1. Vertical ozone distribution 2. Weissenau, Germany.**—*M.R.*

10E–70 551.507.321.2:551.510.534

Schulze, Werner, **Platzhöhen von Radiosondenballonen und Ozongehalt der freien Atmosphäre.** ursting heights of sounding balloons and ozone content of upper atmosphere.] *Annalen der teorologie*, 3(1/2):42–48, Jan./Feb. **1950.** 2 figs., 5 tables. English summary p. 42. **DWB**—erage bursting level of 350 g balloons rises from 112 mb with tropopause at 320–270 mb to 93 mb h tropopause at 200–160 mb. For 500 g balloons bursting level rises from 80 to 67 mb. Variation tropopause and bursting level are similar (highest in summer and in anticyclones). The relation ttributed to variations of ozone content of troposphere and sub-stratosphere, which is increased turbulence and convection when tropopause descends. Effect of temperature is negligible in nparison. Bursting levels are somewhat lower by day than night (effect of insolation). (*Same n as* 6–13, June 1950, *MAB.*) *Subject Headings:* **1. Sounding balloons 2. Atmospheric structure Balloon bursting height 4. Ozone effect on balloons.**—*C.E.P.B.*

10E–71 551.510.534:551.524.7(485)

†Vassy, Arlette and Vassy, Étienne, **Recherches sur l'ozone atmosphérique et la température la stratosphère en Laponie Suédoise.** [Investigation of atmospheric ozone and the temperature the stratosphere in Swedish Lapland.] *Tellus*, 2(2):69–73, May **1950.** 3 figs., 17 refs. Summary English p. 69. **DLC, DWB**—Measurements of ozone in the stratosphere were made by BARBIER, SSY and others at Abisko in Swedish Lapland from Dec. 1934 to March 1935 and during the nmer of 1949 by the authors. Other studies made in the Northern Hemisphere are compared h those made in Lapland. An annual mean temperature variation of >100°C. is shown for ozone layer at Abisko, due to the extreme annual variation in duration of insolation. The ount of ozone at various levels and seasons is discussed. Further studies and measurements cessary to answer questions as to origin of ozone. (*Same item as* 11–51, Nov. 1950, *MAB.*) *bject Headings:* **1. Ozone layer 2. Upper air temperatures 3. Abisko, Sweden.**—*M.R.*

10E–72 551.524.7:551.510.534

Wexler, Harry, **Annual and diurnal temperature variations in the upper atmosphere.** *Tellus*, 1):262–274, Nov. **1950.** 7 figs., 2 tables, 23 refs., 10 eqs. **DWB**—Available theoretical and ob-vational results are combined in order to arrive at vertical temperature distribution values up to km and their annual and diurnal variations. Rates of ozonosphere heating and cooling and their ect upon upper-atmosphere temperature are considered. (For fuller abstract, *see* 2.8–89, Aug. 51, *MAB.*) *Subject Headings:* **1. Annual temperature variations 2. Diurnal temperature varia-ns 3. Upper air temperatures 4. Ozonosphere.**—*G.T.*

10E–73 551.543:551.590.2:551.510.534

Wexler, Harry, **Possible effects of ozonosphere heating on sea-level pressure.** *Journal of eteorology*, 7(6):370–381, Dec. **1950.** 8 figs., table, 24 refs., 18 eqs. Remarks by Fleagle, R. G., d Reply by Wexler, *Ibid.*, 8(3):200–202, June **1951.** 3 refs. **DWB**—The author discusses the pothesis that large scale weather anomalies in the Northern Hemisphere are of extraterrestrial gin and are the result of rapid heating or cooling of the ozonosphere by variable ultraviolet radia-n of the sun and consequent variations in the sea level barometric pressure. In order to determine ether transfers of mass accompany the readjustment processes of thermally produced pressure dients two mathematical models are postulated, namely: 1) a single layer homogenous atmosphere a plane-rotating earth and 2) a two-layer atmosphere. Pressure changes resulting from assumed ounts of heating are computed for both models; and in the case of the second more realistic model effect of sudden heating of the ozonosphere produces an insignificant change in sea level pressure. analysis of a forty year series of daily Northern Hemisphere sea level maps was made in order to termine whether periods of sunspot maxima or minima influence the meridional profile. There evidence that there is an excess of pressure at higher latitudes and a deficit at lower latitudes ring sunspot maxima, but the differences in the pressure profiles are small and random. FLEAGLE jects to and WEXLER defends the use of a simplified model. (*Same item as* 2.3–102 ,March 1951, AB.) *Subject Headings:* **1. Pressure variations 2. Solar influences 3. Ozonosphere.**—*I.L.D.*

1951

10E–74 551.508.952:551.510.41(

Alaska. University. Geophysical Institute, **State of the earth's atmosphere in the Ar** Contract W28-099-ac-445, Research Reports, Nos. 1–11 and 12 (Final Report), Aug. 17, 1 April 30, **1951.** 12 pieces. graphs, tables, refs. **DWB** (M10.5 A 323s)—The final report s marizes all of the work done under this contract at College, Alaska between Feb. 1, 1948 and Apri 1951. Data on daily average concentration of surface ozone are tabulated for Jan. 1950–April together with meteorological data from the local weather bureau. The data were obtained means of an arsenite method which is described (diagram of instrument). Research Reports contain detailed discussions of various methods for measuring surface and total ozone amou (*Same item as* 4J–201, Oct. 1953, *MAB.*) *Subject Headings:* **1. Ozone in Arctic 2. Ozone meas ment techniques 3. College, Alaska. I. Wilson, W. S. II. Cain, J. C. III. Jones, J.**

10E–75 551.510.41:551.508.952(

Bowen, Gerald I. and Regener, Victor H., **On the automatic chemical determination o mospheric ozone.** *Journal of Geophysical Research*, 56(3):307–324, Sept. **1951.** 7 figs., 17 **DLC**—Based on the reaction $O_3+2KI+H_2O\rightarrow 2KOH+O_2+I_2$ an automatic, quantitative recor device has been constructed for use at the surface and in airplanes; it has been tested on S Capillo Peak (9200 ft), N. Mex., and at Acomita C.A.A. Airport (6500 ft) near Albuquerque. tinual recordings made during Dec. 1950 are reproduced showing relative variations in O_3 cor tration, temperature, humidity, dew point, wind direction and speed, for a 30 day period. It been established that O_3 forms in the stratosphere and is brought downward behind polar fr and by subsidence in anticyclones, and that it is destroyed by certain radiations from the sun an vegetation. A network of surface ozone stations and one airplane observation station is b established in New Mexico. Construction and calibration of equipment is described and illustr in detail by schematic and wiring diagrams. (*Same item as* 3.10–90, Oct. 1952, *MAB.*) *Su Headings:* **1. Ozone concentration 2. Chemical ozone determination 3. Ozone networks 4. Mexico.**—*M.R.*

10E–76 551.5

Cauer, H. (*Inst. of Chem. Climatology, Hohenberg a.d. Eger, Germany*), **Some problems o mospheric chemistry.** (In: **Compendium of meteorology.** Boston, American Meteorolo Society, **1951.** p. 1126–1136. 2 figs., 4 tables, 60 refs.) **DWB**—The section on **Absorption methods for detecting traces of gaseous material** describes the classical method of detection b on reaction of KI in a neutral aqueous solution and points out weaknesses and strengths of procedures. An important problem is the simplification of a method for O_3 determination. I discussion of **Results from absorption-tube method,** author presents a table of surface ozone centration in Europe which supports the conclusion that the concentration of O_3 in the air nea ground is, on the average, independent of the height of the sampling point above sea level. investigations are reported on. (For fuller abstract, *see* 4.5–2, May 1953, *MAB.*) *Subject Head* **1. Atmospheric composition 2. Chemical ozone determination.**—*M.L.R.*

10E–77 551.510.41:5

Chapman, Sydney, **Photochemical processes in the upper atmosphere and resultant composi** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 262 fig., 2 tables, 33 refs., 5 eqs.) **DWB**—The study of photochemical processes is most importan the development of our knowledge of the upper atmosphere, especially the ozone layer. The a gives a detailed outline of general principles of gas chemistry, in so far as they are importan meteorologists (energy levels, light absorption and emission, atomic and molecular spectra, excit and deexcitation, dissociation and ionization, collisions, etc.). The absorption and emission spe evidence regarding upper atmospheric composition, the heights of the absorbing and emitting l and the amounts of the absorbing and emitting constituents are examined and some facts a ozone, atomic oxygen and atmospheric sodium are summarized. (*Same item as* 4.8–5, Aug. *MAB.*) *Subject Headings:* **1. Upper atmosphere 2. Photochemistry of upper atmosphere 3 mospheric composition 4. Ozone.**—*A.A.*

10E–78 551.510.534:551.5

†Craig, Richard A., **Radiative temperature changes in the ozone layer.** (In: **Compendiu meteorology.** Boston, American Meteorological Society, **1951.** p. 292–302. 4 figs., tabl refs., 29 eqs.) **DWB**—A concise review is given about the ozone distribution, the temper distribution in the ozone layer, the ozone absorption, the photochemistry of ozone and the po solar effects on the ozone, owing to the large variability of the ultraviolet radiation from th The theory of heating and cooling of the ozone layer is examined and the results of calculatio given. The main heating source is the ozone and oxygen absorption in the ultraviolet. R

ights gave new data on the solar spectrum in the important region 1800 to 3500 Å. The atmos-heric gases, responsible for cooling, may be water vapor, carbon dioxide and ozone. (*Same item as* .9–3, Sept. 1953, *MAB.*) *Subject Headings:* **1. Ozone layer 2. Ultraviolet radiation 3. Ozono-sphere heating.**—*A.A.*

10E–79 551.508.952:546.214

Ehmert, Alfred, **Ein einfaches Verfahren zur absoluten Messung des Ozongehaltes von Luft.** [A simple method for the absolute measurement of the ozone content of air.] *Meteorologische Rundschau*, 4(3–4):64–68, March–April, **1951.** 3 figs., 10 refs. **DWB**—A potassium iodide ap-paratus is described in which titration is replaced by direct electrical measurement of iodine con-centration. Its manipulation and the interpretation of the results are explained. (*Same item as* .10–38, Oct. 1951, *MAB.*) *Subject Headings:* **1. Ozone measurement techniques 2. Ozone meters.** —*C.E.P.B.*

10E–80 551.510.534:551.521.18

†Filler, Aaron S., **Structure of the 9.6 micron band of ozone.** Utah. University. Dept. of Physics, Contract AF 19(122)-392, Stratospheric radiation, Technical Report, No. 2, Oct. 15, **1951.** 58 p. 4 tables, 23 figs., 33 refs., eqs. **DWB**—After a detailed analysis of tri-atomic molecules and their spectral properties, the author presents experimental data of the infrared spectrum of ozone and offers suggestions for determining the structure of the ozone molecule. It is found that no assign-ment of band types can be made for the entire infrared spectrum of ozone which would be consistent with all experimental data. An assignment for the 9.6μ band (representing the main contribution of ozone to the infrared transfer in the stratosphere) is therefore made independently. A table of ADEL's measurements of frequencies of the peak of the P branch as compared to calculated frequencies of the P and R branches, and a table of calculated line frequencies and intensities are presented and discussed. The paper includes ample reference to research reported in recent literature. (*Same item as* 4.4–90, April 1953, *MAB.*) *Subject Headings:* **1. Infrared spectrum of ozone 2. Ozone molecule structure 3. Ozone absorption.**—*G.T.*

10E–81 551.510.534:551.510.535

Fritz, Sigmund, **Ozone measurements during sudden ionospheric disturbances.** *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, 4:343–350, **1951.** 4 figs., 7 refs., 2 eqs. English, German and French summaries p. 343. **DWB**—Ozone amounts on days with sudden ionospheric disturbances were examined by measurements on 3110 Å and 3300 Å. No appreciable change in the ratio of these was observed. (*Same item as* 3.3–91, March 1952, *MAB.*) *Subject Headings:* **1. Ozone variations 2. Ionospheric disturbances.**—*C.E.P.B.*

10E–82 551.510.41:551.515.8(494)

Götz, F. W. Paul and Volz, Friedrich, **Aroser Messungen des Ozongehalts der unteren Tro-posphäre und sein Jahresgang.** [Measurements of lower tropospheric ozone content at Arosa and its annual variations.] *Zeitschrift für Naturforschung*, 6a(11):634–639, Nov. **1951.** 4 figs., refs. **DLC**—Ozone measurements made at Arosa (1860 m.a.s.l.) since March 1950 by means of EHMERT's instrument are discussed. Except for a few upglide situations the (peak) values may be considered as unaffected by orography and therefore representative of the free troposphere. The highest values are usually obtained behind cold air invasions, the lowest ones in tropical air. A marked annual variation is noted: lowest ozone content in winter is followed by rapid filling of the westerly flow with ozone (maximum about 90γ O_3/m^3). Daily values of total ozone over Arosa as measured with a Dobson spectrophotometer are presented. *Subject Headings:* **1. Ozone-air mass relationships 2. Ozone in troposphere 3. Arosa, Switzerland.**—*Transl. of authors' abstract.*

10E–83 551.510.534:551.508.952

†Götz, F. W. Paul, **Ozone in the atmosphere.** (In: **Compendium of meteorology,** Boston, American Meteorological Society, **1951.** p. 275–291. 16 figs., 3 tables, 104 refs., 31 eqs. **DWB**—Instruments and methods of observations are described. The horizontal and vertical distribution and the annual variation are given, and the principal theories on the origin of the atmospheric ozone are examined. The relationship of ozone distribution to the weather is shown. The constitution of the upper atmosphere and the bioclimatological importance of ozone are discussed also. (*Same item as* 4.2–5, Feb. 1953, *MAB.*) *Subject Headings:* **1. Annual ozone variations 2. Ozone distribu-tion 3. Ozonemeters.**—*A.A.*

10E–84 551.510.534:546.214(789)

Johnson, F. S.; Purcell, J. D. and Tousey, R., **Measurements of the vertical distribution of atmospheric ozone from rockets.** *Journal of Geophysical Research*, 56(4):583–594, Dec. **1951.** 6 figs., 2 tables, 11 refs. **DWB**—The ultraviolet spectrum of the sun was photographed by small

automatic spectrographs. Data for the vertical distribution of ozone given for two days. No ozon was found above 45 km, the maximum concentration was between 18 and 24 km. Maximu concentration relative to air was at about 28 km height. (*Same item as* 4.8–79, August 1953, *MAB Subject Headings:* **1. Vertical ozone distribution 2. Rocket soundings 3. White Sands, Ne Mexico.**—*A.A.*

10E–85 551.551:551.574.1:551.510.53

Junge, Christian, **Austausch und grossräumige Vertikalverteilung von Luftbeimengunge** [Exchange and large scale vertical distribution of aerosols.] *Annalen der Meteorologie*, 4(7/9):38(392, 1951. 8 figs., 4 tables, 15 refs. German and English summaries p. 380. **DWB**—Assuming steady supply of small particles into the air over Europe and the austausch coefficient, the vertic distribution of particles is calculated and compared with measurements up to 4½ km and with pote tial gradient. Variations are related to wind speed and austausch below and above inversion It is concluded that in 2–4 km aerosols are mostly of European origin, above that non-Europea Practically all aerosols even over oceans are of continental origin, and change in height distributio when supply stops is calculated. Author then discusses on similar lines distribution of ozone origina ing in the stratosphere, but fails to find expected results. (*Same item as* 3.9–151, Sept. 1952, *MAB Subject Headings:* **1. Aerosols 2. Austausch 3. Vertical ozone distribution.**—*C.E.P.B.*

10E–86 551.508.21:551.510.53

Kuwana, J. and Kira, K., **On the observations of ozone layer in the upper atmosphere by mea of pyrgeometer. Part 1. New design of pyrgeometer and its recorder for ozone observation** *Tateno. Aerological Observatory, Journal*, 5(1):83–91, March **1951.** 6 figs., 13 eqs. English sur mary p. 83. **DWB**—The Ångström pyrgeometer was enclosed in an oil bath of constant tem perature (error less than 1/15°C). Aperture angle 18°. Scheme for an improved recorder using d'Arsonval galvanometer, photoelectric cells, and a vacuum tube is presented and formulas f sensibility and period of recorder are derived. (*Same item as* 4.10–59, Oct. 1953, *MAB.*) *Subje Headings:* **1. Pyrgeometers 2. Ozone measurement techniques.**—*A.A.*

10E–87 551.510.53

Miyake, Y. and Saruhashi, K., **On the annual and meridional variation of the atmospheric ozon** *Papers in Meteorology and Geophysics*, 2(2):150–157, June **1951.** 5 figs., table, 6 refs. Also thei **On the theory of annual variation and meridional distribution of ozone.** *Meteorological Society Japan, Journal*, 2nd Ser., 29(10):347–360, Oct. **1951.** 7 figs., 3 tables, 13 refs., 19 eqs. In Japanes English summary p. 347. **DWB**—By means of calculations it is shown that the total mass of ozo on the earth is almost constant, and that there is a seasonal variation in amount of ozone on ea hemisphere but that the increase in one hemisphere is compensated by a decrease in the other. T photochemical formation of ozone decreases from the equator to the poles so that meridional flo brings about the actual distribution of observed ozone. The approximate velocities of the transpo of ozone poleward are calculated for different latitudes and these are used to explain the seasonal a meridional distribution of ozone. (*Same items as* 4.3–98 and 4.3–99, March 1953, *MAB.*) *Subj Headings:* **1. Ozone distribution 2. Annual ozone variations 3. Upper atmosphere.**—*I.L.D.*

10E–88 551.508.9

Morgen, Alois, **Ozonometrie im meteorologischen Dienst.** [Ozonometry in the meteorologic service.] *Zeitschrift für Meteorologie*, 5(3):71–73, March **1951.** fig., 5 refs. **DWB**—History ozone measurement near the ground is briefly summarized. An instrument in use at Trier is d scribed, based on potassium iodide reaction method. It is cheap, rapid, easily standardized a suitable for climatological stations. (*Same item as* 2.10–39, Oct. 1951, *MAB.*) *Subject Headin* **1. Ozone meters.**—*C.E.P.B.*

10E–89 551.510.534:551.5

Normand, Sir Charles, **Some recent work on ozone.** *Royal Meteorological Society, Quarte Journal*, 77(333):474–478, July **1951.** 2 figs., table, 9 refs. **DLC**—Ozone mixing ratio shou increase with N. winds and subsiding air, decrease with S. winds and rising air, but it is not y proved that all ozone changes are due to advection and vertical motion. Data on vertical d tribution of ozone, synoptic relations and correlations are summarized, including recent work Oxford. (*Same item as* 2.10–59, Oct. 1951, *MAB.*) *Subject Headings:* **1. Ozone mixing ra 2. Ozone-synoptic relationships 3. Vertical ozone distribution.**—*C.E.P.B.*

10E–90 551.510.41:551.510.534(4

Obenland, E., **Ozonuntersuchungen im Hochgebirge.** [Ozone investigations in high mou tains.] *Archiv für Physikalische Therapie*, 5:91–99, **1951.** 4 figs., table, 13 refs. **DNLM.** Phot stat copy available. **DWB** (M10.534 099oz)—Results of simultaneous ozone measurements ma

the summers of 1951 and 1952 at Oberstdorf and Nebelhorn (1100 m altitude difference over 5½ km horizontal distance) are reported. Daily variations of measurements made in undisturbed weather situations show a marked effect of cloudiness. Data on ozone amount as a function of relative humidity are presented. Findings confirm REGENER's theory of turbulent transfer of ozone from higher to lower regions of the atmosphere. *Subject Headings:* **1. Ozone-cloudiness relationships 2. Ozone distribution 3. Nebelhorn, Germany 4. Oberstdorf, Germany.**—*G.T.*

10E–91 551.510.534:551.521.3:551.510.41

Ohio State University. Research Foundation, **The solar spectrum from 7μ to 13μ.** Contract AF 19(122)65, **Infrared studies of atmospheric constituents,** Scientific Report IA-4, Aug. 30, **1951.** 103 p. tables, graphs. Also their: **Regularities in the absorption by ozone in the 9.6μ region.** Scientific Report IA-5, Sept. 30, **1951.** 33 p. tables, graphs, refs. **DWB**—Reports 1–4—An account of the infrared solar spectrum from 7μ to 13μ obtained at the Ohio State University with a high resolution grating spectrometer is given. A map of the spectrum is presented together with a table of line frequencies, and line identifications are given where possible. Absorption bands of atmospheric H_2O, CO_2, O_3, N_2O and CH_4 are described, and the existence of other possible atmospheric constituents is discussed briefly. Many of the unidentified lines in the region from 4.5μ to 8.2μ have now been assigned to H_2O. Report 5—The intense absorption due to O_3 in the 9.6μ region of the solar spectrum has been resolved into some 200 lines. Illustrations show these lines and those due to H_2O and CO_2 (by comparison with laboratory spectra). Remaining lines due to H_2O form 3 regular series, each showing alternating intensity of adjacent lines, with lines of even J value stronger than lines of odd J value. Formulas fitted to this series show values of the near-equal moments of inertia to be 65 to 70 $\times 10^{-40}$ g-cm². *Subject Headings:* **1. Ozone absorption spectra 2. Atmospheric composition 3. CO_2 spectra. I. Contract AF 19(122)65.**—*Author's abstracts.*

10E–92 551.510.534:523.38

Paetzold, H. K., **Die durch die atmosphärische Ozonschicht bewirkte Färbung des Erdschattens auf dem verfinsterten Mond.** [The coloration of the earth shadow on the eclipsed moon by the atmospheric ozone layer.] *Naturwissenschaften*, 38(23):544–545, Dec. **1951.** 2 figs., 6 refs. **DLC**—In a lunar eclipse there is a greenish band a few minutes wide passing through grey to the rust-red of most of the moon. The green zone is attributed to selective absorption around 6000 Å, compared with 5000 Å of rays passing tangentially through the ozone layer. With much or concentrated ozone, color is blue-green; with less ozone, yellow-green. (*Same item as* 3.6–70, June 1952, *MAB.*) *Subject Headings:* **1. Ozone shadow 2. Lunar eclipses 3. Ozone layer.**—*C.E.P.B.*

10E–93 551.510.534:523.38

Paetzold, Hans-Karl, **Über die Erfassung der atmosphärischen Ozonverteilung durch Benutzung von Mondfinsternissen.** [Determination of atmospheric ozone distribution by means of lunar eclipses.] *Zeitschrift für Naturforschung*, 6a(11):639–648, Nov. **1951.** 8 figs., 2 tables, refs., 9 eqs. Also his: **Erfassung der vertikalen Ozonverteilung in verschiedenen geographischen Breiten bei Mondfinsternissen.** [Determination of vertical ozone distribution at various latitudes during lunar eclipses.] *Journal of Atmospheric and Terrestrial Physics*, London, 2(3):183–188, **1952.** 3 figs., table, 9 refs., 3 eqs. English summary p. 183. Also his: **Über die Möglichkeit der Benutzung von Mondfinsternissen zur Erfassung der vertikalen Ozonverteilung in verschiedenen Breiten.** [The use of lunar eclipses for the measurement of the vertical ozone distribution at different latitudes.] *I.U.G.G. Association of Meteorology, Brussels, 1951, Procès-Verbaux des Séances, Mémoires et Discussion*, p. 333–336. pub. **1953.** fig., table, 2 eqs. **DWB, DLC**—Describes a method of measuring vertical distribution of ozone by observations on 6000 Å near edge of earth's shadow. Results agree with distributions from balloon ascents on neighboring days. *Subject Headings:* **1. Ozone measurement techniques 2. Lunar eclipses 3. Vertical ozone distribution.**—*C.E.P.B.*

10E–94 551.590.21:551.510.5:546.214

Penndorf, Rudolph, **Some notes concerning the relationship between solar phenomena and weather.** *New York Academy of Sciences, Transactions, 2nd Ser.*, 13(7):287–290, May **1951.** 3 tables, 8 refs. **DLC**—In looking for some mechanism through which solar activity could influence the weather in the troposphere, several hypotheses are examined. It is concluded from data obtained at Arosa that the total amount of ozone does not follow any solar cycle and that solar radiation does not change appreciably in the UV between 1200 Å and 3000 Å where ozone is produced. The only alternative is that there is some *ionospheric* influence on the troposphere and this has not yet been established. More data are necessary to prove any of the above relationships. (*Same item as* 15.2–186, Feb. 1952, *MAB.*) *Subject Headings:* **1. Solar-weather relationships 2. Ozone.**—*M.R.*

10E–95 551.510.41:535.33(02)

*†Prokof'eva, I. A., **Atmosfernyĭ ozon.** [Atmospheric ozone.] Moscow, Akademiia Nauk, **1951.** 231 p. graphs, charts, diagrs., tables, 213 refs. Price: 11 rubles, 50 kop. **DLC**—A sys-

tematically organized and technical monograph covering every aspect of: a) instrumentatio b) computation and c) interpretation of data on ozone in the atmosphere, based on work of Russia and foreign scientists from 1879 to 1950. The first chapter reviews the theory and history of researc on spectral absorption by ozone (in the UV, visible and infrared bands), the influence of temperatu and pressure on coefficient of absorption, the structure of the ozone molecule, oxygen absorption a the distribution of energy in the UV portion of the solar spectrum. The second chapter cove all of the known methods of measurement of atmospheric ozone (including the spectrograph, spectr photometer, filter and integrating photometers); methods of determination of ozone by observatio of direct sun's rays, from zenith sky observations in clear and cloudy weather, moonlight, starligh influence of aerosols; measurement of surface ozone by optical, chemical and fluorescent mean methods of determining thickness, temperature and vertical distribution of ozone layer. Ch. I gives summaries of observational data, analyzed according to diurnal, seasonal and nonperiod (relation to thunderstorms, fronts, air masses, weather, etc.) variations and magnetic or solar activit The final chapter is devoted to theoretical discussion of the causes of the vertical distributio turbulent and molecular diffusion, the diurnal and annual periodic and the nonperiodic variations ozone in the ozonosphere and at the surface. An unusual amount of quantitative data is present in tabular and graphic form and the bibliography of 213 items (of which 58 are in Russian) cove most of the important literature up to 1949. (*Same item as* 3.4–9, April 1952, *MAB.*) *Subj Headings:* **1. Ozone textbooks 2. Ozonemeters 3. Spectroscopy.**—*M.R.*

10E–96 551.510.534:551.513:546.2

Reed, Richard J. and Julius, Anthony L., **A quantitative analysis of two proposed mechanism for vertical ozone transport in the lower stratosphere.** *Journal of Meteorology*, 8(5):321–325, O **1951.** 2 figs., 2 tables, 15 refs., 15 eqs. Also: Kellogg, William W., **Remarks on "A quantitati analysis of two proposed mechanisms for vertical ozone transport in the lower atmosphere."** *Ibi* 9(6):446, Dec. **1952.** 5 refs. **Reply** by Richard J. Reed, p. 446–447. **DWB**—Investigates d tribution of nonequilibrium ozone (amount in excess of photochemical equilibrium below level maximum concentration). An equation for changes of ozone density in 10–20 km is derived involvi the meridional circulation and turbulent vertical mixing. Each of these terms is evaluated assumi it to be of the sole cause of the known distribution by month and latitude. The meridional circul tion is ineffective unless it extends over both hemispheres, but stratospheric austausch coefficie of 1 to 20 g/cm/sec can explain the observed variations of nonequilibrium ozone. KELLOGG suppo meridional circulation explanation of annual variation of ozone in high latitudes. (*Same items* 3.4–99, April 1952 and 4.9–89, Sept. 1953, *MAB.*) *Subject Headings:* **1. Ozone-atmospheric circul tion relationships 2. Vertical ozone transport.**—*C.E.P.B.*

10E–97 551.510.5

Regener, Victor H., **Vertical distribution of atmospheric ozone.** *Nature, London*, 167(4242):27 277, Feb. 17, **1951.** 2 figs., 4 refs. **DWB**—Gives results of spectroscopic determination of verti distribution of ozone, 10–30 km, in 4 sounding balloon ascents. Maximum ozone in cm/km w .02 to .035 between 15 and 25 km, maximum ozone molecules/10^6, air molecules 6 at 25 km. (*Sa item as* 2.5–57, May 1951, *MAB.*) *Subject Headings:* **1. Atmospheric structure 2. Vertical ozo distribution.**

10E–98 551.508.952:551.508.8

Sakai, I. and Tamura, T., **The trial manufacture of ozone radiosonde.** *Tateno. Aerologi Observatory, Journal*, 5(1):97–98, March **1951.** 2 refs. **DWB**—Abstract of paper presented meeting. Fluorescent film emits visible rays by excitation of ultraviolet shorter than 3300 Intensity observed by photo-conductor, manufactured by evaporation of selenium on a glass pla *Subject Headings:* **1. Ultraviolet intensity meters 2. Ozonesondes.**—*A.A.*

10E–99 551.508.952:551.510.534:535

*Tcheng, Mao-lin, **Mesures de la quantité d'ozone contenue dans l'atmosphère par spect photométrie photographique du ciel bleu au zénith.** [Measurements of the amount of ozone c tained in the atmosphere by photographic spectrophotometry of the zenith blue sky.] *Annales Géophysique*, 7(1):45–58, Jan.–March **1951.** 10 figs., 4 tables, 13 refs. French and English su maries p. 45. **DLC**—The Götz quartz spectrograph, used to determine the depth of the ozone la from the last observed wave length when pointing the instrument at the sun, is tested for use pointing at the zenith during clear weather. The observations presented in detailed tables a graphs were made at Arosa from Feb.–May, 1950. One hundred, 5-min. observations were selec for analysis on the microphotometer at the Lyon Observatory. The slopes of the times of obser tions on log paper are not parallel for different days—hence, the author concludes that the meth is not completely applicable to zenith blue sky measurements. Measurements were made by G on the same days with a Dobson spectrophotometer. The results of the plotting of data obtai

the two methods show a fair correlation which allows a variable correction to be applied to the ave length, depending on the depth of the ozone layer. Later observations made by the spectro-otometric method, and calculation by the Dufay method, give values which agree better with the bson instrument measurements. The *Umkehr* effect of Götz is considered in analyzing the mparative intensity of two radiations. Coefficients obtained by several authors are compared aphically with a theoretical curve for the wave lengths from 3025 to 3175 Å. (*Same item as* 3.10–, Oct. 1952, *MAB.*) *Subject Headings:* **1. Ozone measurement techniques 2. Ozone data Spectroscopic ozone measurement 4. Umkehr effect 5. Arosa, Switzerland.**—*M.R.*

10E–100 551.571:551.510.534

Vassy, Etienne (*Prof., Faculté des Sciences, Paris*), **Quelques apports de la physique de l'atosphère à la météorologie.** [Contributions of atmospheric physics to meteorology.] *Mathetical and Physical Society of Egypt, Cairo, Proceedings*, 4(3):7–15, **1951.** 9 figs., 11 refs. Abracted from reprint. **DWB**—Elementary discussion. Author compares precipitable water ntent measured directly with radiosonde data and gives a general summary of the vertical, seasonal d geographical distribution of ozone. Attempts to explain advective processes in ozone layer. *ame item as* 5.9–211, Sept. 1954, *MAB.*) *Subject Headings:* **1. Precipitable water 2. Ozone stribution.**—*A.A.*

10E–101 551.510.41:546.214(798)

Wilson, W. S., **Surface ozone at College, Alaska.** *American Geophysical Union, Transactions*, (4):552–554, Aug. **1951.** 2 figs., 5 refs. Also: Wilson, Wm. S.; Guenther, Wm. B.; Lowrey, obert D. and Cain, Joseph C. **Surface ozone at College, Alaska, for the year 1950.** *Ibid.*, 33(3): 1–364, June **1952.** 2 figs., table, 7 refs. **DWB**—Daily average values of the concentration of one in the atmosphere near the surface are determined by the oxidation by ozone of iodine to ide which in turn oxidizes sodium arsenite to sodium arsenate; a diagram of the absorption column given. Measurements of ozone concentration obtained at College from January–March 1950 dicate moderately large interdiurnal variations with the maxima considerably higher than the inima. The concentration of ozone increases with increasing altitude of the sun. The ozone lues are much more irregular and averages much higher than those obtained at lower latitudes. he daily average concentrations of ozone in the atmosphere near the surface at College, Alaska at. 65°N, long. 148°W), were determined during 1950 by the absorption of ozone in a solution of otassium iodide and standard sodium arsenite. The results, which were generally higher and more ratic than those found at lower latitudes, ranged from one to 75 mg/100 m^3 of dry air at standard nditions to give a yearly average of 9.8 mg/100 m^3 (or 4.6×10^{-8} molecules of ozone per molecule air). The monthly averages showed a principal maximum in April, a secondary maximum in July id a minimum in August. (*Same item as* 3.5–115, May 1952 and 4.3–89, March 1953, *MAB.*) *ubject Headings:* **1. Ozone in troposphere 2. Ozone determination 3. College, Alaska.**—*Authors' bstracts.*

10E–102 535.33:551.508.952

Yamasaki, M. and Akita, T., **On the measurement of ozone in the atmosphere by quartz ectrograph.** *Tateno. Aerological Observatory, Journal*, 5(1):97, March **1951.** fig. **DWB**—bstract of paper presented at meeting. Sketch of spectrograph used is given. *Subject Headings:* **Spectrographs 2. Spectroscopic ozone measurement.**—*A.A.*

1952

10E–103 551.510.41(794)

Bartel, A. W. and Temple, J. W. (*U. S. Rubber Co.*), **Ozone in Los Angeles and surrounding eas.** *Industrial and Engineering Chemistry*, 44(4):857–861, April 2, **1952.** 8 figs., 3 tables, 13 fs. **DLC**—An apparatus based on the absorption of ozone by potassium iodide, was used for easuring ozone content at Los Angeles and vicinity. Data on ozone equivalent for 1949–1951 e presented on tables and graphs and compared with data on maximum temperature and relative midity. A comparison with ozone equivalent data from other locations in the U. S. shows that nounts at Los Angeles and vicinity are relatively high. It is found that amounts for the city area ow agreement with results obtained at non-city stations and the hypothesis of an effect due to ecial components of the city atmosphere is dismissed. (*Same item as* 4.1–80, Jan. 1953, *MAB.*) *ubject Headings:* **1. Ozone variations 2. Ozone measurement 3. Los Angeles, Calif.**—*G.T.*

10E–104 551.508.93:551.521.17:535.33

Bezverkhniĭ, Sh. A.; Osherovich, A. L. and Rodionov, S. F., **Elektrofotometricheskie issledoaniia prozrachnosti atmosfery v ul'trafioletovoĭ oblasti spektra.** [Electrophotometric investigations atmospheric transparency in the ultraviolet region of the spectrum.] *Akademiia Nauk, SSSR, vestiia, Ser. Geofiz.*, No. 3:93–102, **1952.** 13 figs., 2 tables, 13 refs. **DLC**—Methods and apparatus

for determining the ozone content of the atmosphere and for investigating the phenomenon anomalous transparency at wave length 2850–4000 Å associated with an aerosol component of atmosphere are described. The apparatus consists of a monochromator of double resolution with attached photometer. Circuit diagrams and descriptions are given of spectrophotometer with photoelectric multiplier, of an integral photometer with a photomultiplier for increasing sensitiv and of an integral photometer with a photoelectric cell. The results of measurements of the ult violet radiation of the sun and moon and of the phenomenon of anomalous transparency are p sented. (*Same item as* 4.5–60, May 1953, *MAB.*) *Subject Headings:* **1. Electrophotometry 2. mospheric transparency 3. Ultraviolet spectrum 4. Ozone measurement techniques 5. U.S.S** —*I.L.D.*

10E–105 551.508.952 551.510.534:546.

Dobson, G. M. B., **Ozone in the earth's atmosphere.** *Endeavour*, London, 11(44):215–219, O **1952.** 4 figs., 6 eqs. **DWB**—A concise and nontechnical discussion of the meteorological significa of ozone, the probable process of ozone formation in the upper atmosphere, the methods of measur the amount of ozone in the atmosphere, its vertical distribution in the atmosphere, its gene distribution over the world, its variations under the influence of weather and its presence in the lo atmosphere. (*Same item as* 4.8–78, Aug. 1953, *MAB.*) *Subject Headings:* **1. Ozone distribut 2. Ozone measurement techniques 3. Ozone variations.**—*I.L.D.*

10E–106 551.508.952 551.510.41:546.

Ehmert, Alfred, **Gleichzeitige Messungen des Ozongehaltes bodennaher Luft an mehre Stationen mit einem einfachen absoluten Verfahren.** [Simultaneous measurements of the oz content of the air near the earth at several stations by means of a simple absolute method.] *Jour of Atmospheric and Terrestrial Physics*, London, 2(3):189–195, **1952.** 11 figs., 7 refs., eqs. Eng summary p. 189. **DWB**—Observations were taken at several stations around Weissenau, includ Arosa, with a simple accurate electrical iodine apparatus, which is described and illustrated. Se characteristic of different weather types are compared graphically. They show the rapid destruct of ozone near the ground, especially in town haze with combustion gases, and renewal from ab (*Same item as* 3.10–70, Oct. 1952, *MAB.*) *Subject Headings:* **1. Ozone measurement 2. Oz meters.**—*C.E.P.B.*

10E–107 551.510.41:526.

Ehmert, Alfred, **Über örtliche Einflüsse auf den Ozongehalt der Luft.** [On local influences the ozone content of the air.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* 38:283–285, **1952.** 3 figs., 4 refs. **DWB**—Ozone measurements at Weissenau on the ground at a height of 20 m on a tower are discussed. In fine summer weather with very light winds la differences occurred, attributed to destructive effect of vegetation on ozone. Effects of thun storms, night ground fog and strong sunshine are also illustrated. (*Same item as* 4.2–80, Feb. 19 *MAB.*) *Subject Heading:* **1. Ozone measurements.**—*C.E.P.B.*

10E–108 551.510.41:546.214:551.508.

Heigel, K. (*Bad Tölz*), **Messmethoden des bodennahen Ozons und ihre Verwendung in Praxis.** [Methods for measuring ozone near the ground and their practical applications.] *many. Deutscher Wetterdienst in der US-Zone, Mitteilungen*, No. 14, April **1952.** 19 p. 8 fi 2 tables, 13 refs. **DLC**—The meteorological value of a quantitative determination of ozone n the ground and the chemical basis for determining ozone by its reaction with KI and its titra with sodium thiosulfate are discussed. The author thus describes the electrometric titra method of EHMERT, the "Aran" measuring apparatus of CURRY-DIRNAGLE and the ozone measu apparatus of EFFENBERGER. The various apparatus are illustrated with diagrams. Their op tions and calibration are discussed in detail and the advantages and disadvantages of the var apparatus are analyzed. (*Same item as* 4.2–81, Feb. 1953, *MAB.*) *Subject Headings:* **1. Oz measurement techniques 2. Ozonemeters.**—*I.L.D.*

10E–109 551.508.952 551.510.41:546

*Hinzpeter, Hans, **Ergebnisse der in den Jahren 1941–1945 in Potsdam durchgeführten Oz messungen.** [Results of ozone measurements carried out at Potsdam, 1941–1945.] *Germ Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Veröffentlichun* No. 9, **1952.** 22 p. mostly tables, 3 refs. **DWB**—One of the few systematic measurement se Instrument: ozone spectrometer according to DOBSON. Intensity measurements in 3110 and 330 or 4450 Å; ratio depends on ozone content. Data given for ozone content reduced to nor temperature and pressure together with solar height, path of solar rays through atmosphere ozone layer, as well as state of sky and visibility during measurement. (*Same item as* 5.1–104,

54, *MAB.*) *Subject Headings:* **1. Ozone measurement 2. Ozone data 3. Potsdam, Germany.** *A.*

10E–110 551.508.952:551.510.41:526.214

Jessel, U., **Untersuchungen über die Vergleichbarkeit chemischer Ozonmessungen.** [Investigations on the comparability of chemical ozone measurements.] *Germany. Deutscher Wetterdienst in der U. S. Zone, Berichte,* No. 38:285–288, 1952. 3 tables, 22 refs. Also his: **Über die Eignung von Frittfilterwaschrohren für Ozonanalysen atmosphärischer Luft.** [The suitability of fritted filter tubes for atmospheric ozone analysis.] *Ibid.,* No. 42:344–349, **1952.** 2 figs., 5 tables, refs. **DWB**—Results of measurements of ozone with the apparatus developed by H. Cauer and Ehmert are compared. The former gives less than half the latter, which gives the true value. uses of difference are discussed. (*Same items as* 4.2–82, Feb. 1953 and 4.10–67, Oct. 1953, *MAB.*) *bject Heading:* **1. Ozone meters.**—*C.E.P.B.*

10E–111 551.508.952:551.510.534

Johnson, Francis S.; Purcell, J. D.; Tousey, R. and Watanabe, K., **Direct measurements of the tical distribution of atmospheric ozone to 70 kilometers altitude.** *Journal of Geophysical Research,* (2):157–176, June **1952.** 10 figs., 5 tables, 21 refs., 19 eqs. Review in *Uspekhi Fizicheskikh Nauk,* (2):320–324, Feb. **1953. DLC**—Atmospheric ozone was measured to an altitude of 70 km over White Sands Proving Grounds, N. Mex., on June 14, 1949. The data were obtained from a ies of solar ultraviolet spectra photographs near sunset from two spectrographs installed in an robee rocket. The ozone concentration above 35 km decreased approximately exponentially and s in good agreement with the concentration calculated from photochemical theory, provided that three-body collision process $O+O+M \rightarrow O_2+M$ was considered. (*Same item as* 4.3–97, March 53, *MAB.*) *Subject Headings:* **1. Ozone distribution 2. Ozone measurement techniques White Sands, N. Mex.**—*Authors' abstract.*

10E–112 551.510.534(581)

Khalek, Abdul and Vassy, Arlette, **Variation diurne de l'épaisseur réduite et de la température yenne de l'ozone atmosphérique aux basses latitudes.** [Diurnal variation of reduced thickness d mean temperature of atmospheric ozone in low latitudes.] *Académie des Sciences, Paris, mptes Rendus,* 235(14):737–738, Oct. 16, **1952.** Also Khalek, A., **Variation annuelle de l'épaisseur luite et de la température moyenne de l'ozone atmosphérique en Afghanistan.** [Annual variation the reduced thickness and mean temperature of atmospheric ozone in Afghanistan.] *Ibid.,* 5(25):2424–2426, June 22, **1953.** table, 6 refs. **DLC**—In the course of a spectrophotographic dy of diffuse solar radiation at Kabul (34°N, 1,800 m elev.) from Dec. 1950 to Dec. 1951 (140 ys of measurement), ozone thickness and temperature were determined at wavelengths between 55 and 3248 Å. According to the first paper values of reduced thickness showed definite decrease out local noon, of the order of 5% in winter and over 20% in spring and summer. In the second per monthly values of reduced thickness and of average ozone temperature are tabulated for the elve months. The annual variation of ozone thickness shows two maxima connected with tropical mass invasions. The ozone temperatures are higher than elsewhere, which appears to indicate at the ozone layer is higher in low latitudes than in moderate latitudes (a fact confirmed by sound opagation studies). (*Same items as* 6.11–173, Nov. 1955 and 5.2–87, Feb. 1954, *MAB.*) *Subject adings:* **1. Ozone variations 2. Ozonosphere temperatures 3. Kabul, Afghanistan.**—*G.T.*

10E–113 551.510.534 551.593.652

*§Langlo, Kaare, **On the amount of atmospheric ozone and its relation to meteorological conditions.** *ofysiske Publikasjoner,* Oslo, 18(6), **1952.** 42 p. 12 tables, 14 figs., foot-refs., eqs. Discussion *Meteorological Magazine,* 83(979):15–20, Jan. **1954** and in *Weather,* 8(12):369–370, Dec. **1953. WB**—Various papers on the relation between atmospheric ozone and meteorological conditions at have appeared since 1938 are reviewed. The available observational data on atmospheric one values are summarized and given in tables. The optical method of measuring the total amount atmospheric ozone is described and the sources of error are discussed. The causes of the observed riations from year to year in the annual mean amount of ozone are attributed to variations of unveloped conditions in the ozone incline region and its variations with latitude are analyzed and e various theories explaining it are reviewed. The annual period in the amount of ozone is detmined by meteorological conditions. The advection of ozone due to the general circulation of the nosphere accounts for seasonal changes in the amount of ozone. The highest ozone values ring the passage of a polar front cyclone are found near the center of the tropopause trough beging to the cyclone. The relationship of atmospheric ozone to the formation of mother of pearl uds is discussed and various theories on the causes of variations of atmospheric ozone are conered. (*Same item as* 4.10–8, Oct. 1953, *MAB.*) *Subject Headings:* **1 Ozone variations 2 Naeous clouds** —*I.L.D.*

10E–114 551.510.534:546

†Mitra, Sisir Kumar, **The ozonosphere** (In his: **The upper atmosphere** 2nd ed. Calcu The Asiatic Society, **1952** p. 119–162. 30 figs., table, 63 refs. (p. 647–648), 22 eqs.) **DLC**—A an introduction which reviews briefly the early investigation of the ozonosphere, the author takes the absorption spectrum of ozone; vertical distribution of ozone (experimental and theore methods of investigation); ozone as a heating agent; variations of atmospheric ozone (temporal latitudinal); ozone and weather. (For fuller abstract, *see* 4.8–15, Aug. 1953, *MAB.*) *Su Headings:* **1 Ozone 2 Ozonosphere** —*M.L.R.*

10E–115 551.510.41:546

†Mukherjee, Nalin R., **Evaluation of chemical methods for the determination of atmosph ozone** Alaska. Univ. Geophysical Institute, Contract AF 19(604)-127, Scientific Report, N Nov. 15, **1952** 86 p. 2 figs., 12 tables, 155 refs., 80 formulas.—The various chemical and spec scopic methods of quantitative O_3 determination in samples are discussed briefly and the chem methods treated in great detail. Two general types of chemical determination are differentia 1) the Tater methods including the potassium iodide, the thiosulphate and the arsenite methods, 2) the spectro-chemical methods including tetrabase, fluorescein, dihydroacridine and other meth The thiosulphate and arsenite methods are reviewed more critically in Ch. II; the determina of the end point in titration in Ch. III, and the experimental procedures and effects of pH, UV li sunlight, CO_2, O_2, etc. in Ch. IV discussed. Other constituents of polluted air are discusse appendix, for instance H_2O_2, nitrogen oxides (5 of them singly or in combination), sulphur oxi NH_4, H_2S, etc. Suggestions for eliminating these oxidants are given. *Subject Heading:* **1 Chem ozone determination** —*M.R.*

10E–116 551.510.41:546.214(43

Neuwirth, R., **Über Messungen des bodennahen Ozons in Südwestdeutschland** [Meas ments of ozone near the ground in southwest Germany.] *Baden. Landeswetterdienst, Jahresbe mit Abhandlungen*, **1951/1952** p. 155–168. 9 figs., 2 tables, 16 refs. **DWB**—Study based on o measurements at different places in Baden, extended over 2½ years. An attempt is made to corr the results with static and dynamic lability, wind direction, air masses, wind shear at 850 simultaneous values at different stations, etc. Higher ozone content was observed for surface w from the east. The air masses did not show significant differences, except for maritime cold (*Same item as* 5.7–69, July 1954, *MAB.*) *Subject Headings:* **1 Ozone near the ground 2 O measurements 3 Baden, Germany** —*A.A.*

10E–117 551.510.534:52

Paetzold, H. K., **Schwankungen der vertikalen Ozonverteilung in 0° und 60° geographis Breite nach Messungen bei Mondfinsternissen** [Variations in the vertical ozone distributio 0° and 60° lat. during lunar eclipses.] *Germany. Deutscher Wetterdienst in der US-Zone, Beri* No. 38:292–294, **1952** 2 figs., 15 refs. **DWB**—The height distribution of ozone in different latit can be estimated from the brightness distribution near the dark edge of lunar eclipses. Valu lat. 0° and 60° on several eclipses are plotted, showing great variations at heights of 30 km (*Same item as* 4.3–100, March 1953, *MAB.*) *Subject Headings:* **1 Vertical ozone distribut 2 Lunar eclipses** —*C.E.P.B.*

10E–118 551.510.534:52

Paetzold, Hans-Karl, **Weitere Bestimmungen der vertikalen Ozonverteilung bei M finsternissen** [Further determinations of the vertical distribution of ozone during lunar eclip *Zeitschrift für Naturforschung*, 7a(5):325–328, May **1952** 3 figs., 3 tables. **DLC**—Author g 4 further examples of determination of amount of ozone (0.20–0.36 cm) and ratio ozone/air heights up to 40 km, in 1932 (60°S and 0°) and 1943 (50°N, 20°S). Results show decrease high to low latitudes in spring. Heights of maximum (20–25 km) agree with balloon results. (*Same item as* 3.10–96, Oct. 1952, *MAB.*) *Subject Headings:* **1 Vertical ozone distribution 2 Lu eclipses** —*C.E.P.B.*

10E–119 551.510.534:551

Pekeris, Chaim Leib, **Report on atmospheric ozone as a possible meteorological factor** 13 p. 8 figs., 3 tables, 18 refs. Typescript. **DWB**—In this survey of recent research repo by various scientists, the amount and horizontal and vertical distribution of atmospheric oz its advection, seasonal and diurnal variations, correlation with cyclones, anticyclones, pressure temperature and possible effect on weather are discussed and pertinent data obtained at va stations both in the Northern and Southern Hemispheres presented in tables, graphs and ch (*Same item as* 3.9–87, Sept. 1952, *MAB.*) *Subject Headings:* **1 Vertical ozone distribution 2 O variations 3 Ozone-weather relationships** —*G.T.*

10E–120 551.510.41:551.521.11(771)

Popp, George E. and Harbison, Lynn (*Phillips Chemical Co., Akron, Ohio*), **Ozone and sunlight effect on aging of carbon black vulcanizates** *Industrial and Engineering Chemistry*, 44(4):837–840, April 2, 1952 12 figs., 2 tables, 6 refs. **DLC**—This study was initiated to determine the effects, if any, of individual types of carbon blacks on checking and ozone cracking of natural and synthetic rubber under static testing conditions. Specimens were exposed to sunlight aging in Akron, Ohio, during April and May of 1950 under 12½% strain, and an additional series of specimens were simultaneously tested with a 180 degree bend. The results show that carbon blacks, regardless of type, particle size, structure, and physical properties imparted, do not affect the rate of degree or cracking in the polymers studied upon exposure to either sunlight or ozone when under static stress. (*Same item as* 4.8-75, Aug. 1953, *MAB.*) *Subject Headings:* **1 Ozone effects 2 Sunlight effects 3 Akron, Ohio** —*From authors' abstract.*

10E–121 551.508.952:551.510.41:526.214

Pring, J. N. and Westrip, G. M., **Electrometric determination of ozone at high dilutions.** *Nature*, London, 170 (4326):530–531, Sept. 27, **1952.** 2 refs. **DWB**—Describes a method of determining local atmospheric concentrations of ozone by a portable apparatus which measures the E.M.F. of a system in which hydrobromic acid is oxidized with liberation of bromine. (*Same item as* 4.2–28, Feb. 1953, *MAB.*) *Subject Heading:* **1. Ozone measurement techniques.**—*C.E.P.B.*

10E–122 551.510.534

Ramanathan, K. R.; Moorthy, Bh. V. R. and Kulkarni, R. N., **The effect of secondary scattering in the calculation of the vertical distribution of atmospheric ozone from the Götz inversion-effect.** *Royal Meteorological Society, Quarterly Journal*, 78(338):625–626, Oct. **1952.** table, 6 refs. **DWB**—Calculation of vertical distribution of ozone from ratio of intensities of light from zenith sky at different zenith distances of the sun introduces errors if secondary scattering is ignored. Observations at Mt. Abu on wave lengths 3040–3200 Å and 3240–3430 Å are used to recalculate ozone distribution at different levels, giving maximum day-to-day variation in layer 18–27 km. (*Same item as* 4.3–101, March 1953, *MAB.*) *Subject Heading:* **1. Vertical ozone distribution.**—*C.E.P.B.*

10E–123 551.521.17:551.510.534:546.214

†Regener, Victor H. (*Univ. of New Mexico*), **Atmospheric ozone.** (In: U. S. School of Aviation Medicine, Randolph Field, Texas, **Physics and medicine of the upper atmosphere.** Albuquerque, **1952.** p. 109–122. 3 figs., 50 refs.) **DLC**—A concise summary reviewing the literature on the total amount of atmospheric ozone, the vertical distribution of ozone, the absorption of ultraviolet sunlight by ozone, the toxic and chemical effects of atmospheric ozone and the transport of ozone between stratosphere and troposphere. Graphs showing the vertical distribution of atmospheric ozone over New Mexico, ozone recordings on the earth's surface and various physical characteristics of the atmosphere due to ozone such as ratio of number of ozone molecules to air molecules, amount of ultraviolet sunlight penetrating each altitude, etc., and an extensive bibliography are included. (*Same item as* 4.8–83, Aug. 1953, *MAB.*) *Subject Headings:* **1. Ozone 2. Vertical ozone distribution 3. Ultraviolet absorption.**—*I.L.D.*

10E–124 551.510.41:546.214 551.510.534

Regener, Erich, **Über Schwankungen des Ozons in der Troposphäre und Stratosphäre.** [On fluctuations of ozone in the troposphere and stratosphere.] *Journal of Atmospheric and Terrestrial Physics*, London, 2(3):173–182, **1952.** 17 figs., 12 refs. English summary p. 173. **DWB**—Ozone content fluctuates greatly at all heights. As it is destroyed in 1–3 hours in dusty surface air it must be brought from above. At Friedrichshafen, on quiet days, there is a maximum about 15 h and night minimum; in turbulent weather the latter disappears. Diurnal variation changes with height and is smoothed out on mountain peaks, the ozone-poor surface air subsiding into the valleys at night. Vertical variation up to 9 km is related to temperature and cloud layers. Marked variations of distribution up to 30 km are compared with air trajectories at 16 km; west winds at Weissenau show strong maximum above 20 km, E.N.E. winds, weak maximum below 20 km. (*Same item as* 3.9–81, Sept. 1952, *MAB.*) *Subject Headings:* **1. Diurnal ozone variations 2. Vertical ozone distribution 3. Upper atmosphere.**—*C.E.P.B.*

10E–125 551.524.7:551.510.534

Regener, Erich, **Zur Erklärung der Warmlufteinbrüche in die untere Stratosphäre.** [On the explanation of warm air inbreaks in the lower stratosphere.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:289–291, **1952.** 2 figs., 9 refs. **DWB**—Abnormally high stratosphere temperature at 20–30 km on 14.3.52 is attributed to a deep ozone layer brought down by strong vertical turbulence. (*Same item as* 4.2–147, Feb. 1953, *MAB.*) *Subject Headings:* **1. Stratospheric temperatures 2. Ozone variations.**—*C.E.P.B.*

10E–126 551.510.41:546.214:535.

Smith, Ralph G. and Diamond, Philip, **The microdetermination of ozone.** *American Industri Hygiene Association Quarterly*, 13(4):235–238, Dec. **1952.** table, fig., 5 refs. **DLC**—Where minu amounts of O_3 are present in a sample (such as in the atmosphere), the various methods of analys used heretofore which are accurate for large amounts have not proven satisfactory. The auth tried more sensitive fluorescein methods but found them too sensitive to other factors. By usi the standard KI methods, but in alkaline (NaOH) instead of neutral or acid solutions, and spectr photometric instead of titration analysis, he succeeded in obtaining consistent results from: identical samples, b) varying sampling rate by about 400%, and c) varying KI concentration a factor of 5. The photometry was carried out at 352 mμ. (*Same item as* 6.3–93, March 195 *MAB.*) *Subject Headings:* **1. Ozone analysis 2. Spectrophotometric ozone determination 3. Ozo measurement techniques.**—*M.R.*

10E–127 551.521.17:551.510.5

Stair, Ralph, **Ultraviolet radiant energy from the sun observed at 11,190 feet.** *U. S. Nation Bureau of Standards, Journal of Research*, 49(3):227–234, Sept. **1952.** 6 figs., 4 tables, 26 re **DLC**—This paper gives the results of some measurements on the ultraviolet and short wavelen visible spectral energy distribution of direct solar radiation, made in September 1951, at Clima Colo., altitude 11,190 ft. Data are given for wavelengths extending from 535 to 299.5 millimicro for a number of air masses from 0 to 3.0. A determination of atmospheric transmittance as a fun tion of wavelength results in calculated amounts of ozone approximating 0.21 cm (*ntp*) for seve days during Sept. This value is in good agreement with previous determinations by other metho for the season of the year and the geographical latitude of Climax. *Subject Headings:* **1. Ultraviol radiation data 2. Ozone thickness 3. Climax, Colo.**—*Author's abstract.*

10E–128 551.501.7:551.510.41:546.2

Teichert, F., **Erfahrungen mit chemischen Ozonmessmethoden.** [Experience with chemic methods of measuring ozone.] *Zeitschrift für Meteorologie*, 6(5):132–138, May **1952.** 3 fig 24 refs. **DWB**—A detailed description and critical analysis of the determination of atmospher ozone by the chemical methods of REGENER and CAUER and of the silica gel method. The form two methods which employ KI are not precise in contaminated air; the latter is very exact und all conditions but is complicated. The problem of the presence of reducing gases is considere (*Same item as* 4.1–34, Jan. 1953, *MAB.*) *Subject Headings:* **1. Chemical ozone determinati 2. Ozonemeters.**—*I.L.D.*

10E–129 551.510.534:551.507.3

Van Allen, J. A. and Hopfield, J. J. (*Applied Physics Lab., Johns Hopkins Univ., Silver Spri Md.*), **Preliminary report on atmospheric ozone measurements from rockets.** *Société Royale d Sciences de Liège, Mémoires, Ser. 4*, 12(1/2):179–183, **1952.** fig. **DLC**—Rocket (aerobee) bor ozone spectrometer is illustrated diagrammatically and results of flight on Jan. 25, 1951 at Whi Sands, N. Mex., using a quartz spectrograph, shown for 5 km height intervals from 25 to 60 k (0.061 cm at 25 and 0.000054 cm at 60 km). (*Same item as* 5.11–65, Nov. 1954, *MAB.*) *Subj Headings:* **1. Ozone distribution in upper atmosphere 2. Rocket instrumentation 3. Quan spectrographs.**—*M.R.*

10E–130 551.510.41:526.2

Volz, F., **Über die Zerstörung des Ozons in der Troposphäre.** [On the destruction of ozone the troposphere.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:257–26 **1952.** 4 figs., 6 refs. German and English summaries p. 257. **DLC**—Measurements of effect ozone on wood, stone, vegetation and water in Arosa show similarity and depend on turbulen Clouds and combustion gases rapidly dissociate ozone, and in average cloudiness 1% of stratosph ozone in mid-latitudes must be brought down daily to compensate loss. (*Same item as* 3.10–9 Oct. 1952, *MAB.*) *Subject Heading:* **1. Ozone.**—*C.E.P.B.*

1953

10E–131 551.513.1:551.510.534:551.5

Brewer, A. W. (*Clarendon Lab., Oxford*), **The variations of ozone and water vapour concentr tions. The value of observations.** *International Union of Geodesy and Geophysics. Associati of Meteorology, Brussels, 1951, Procès-Verbaux des séances. Mémoires et discussion*, p. 338–34 **1953.** 3 figs. **DWB**—Shows how knowledge about the general stratospheric circulation and interaction with the troposphere could be obtained by the measurement of the average verti ozone and water vapor profiles up to 25 km at all latitudes. Three cases are discussed: a) no me circulation, b) a single mean circulation with a stratospheric movement towards the poles, a

) a double mean circulation meeting at the equatorial tropopause. (*Same item as* 8.3–157, March 957, *MAB.*) *Subject Headings:* **1. Atmospheric circulation 2. Ozone concentration 3. Water apor profiles.**—*A.A.*

10E–132 551.510.41:546.214

Carbenay, Janine and Vassy, Arlette, **Dosage continu de l'ozone atmosphérique.** [Continuous etermination of atmospheric ozone.] *Annales de Géophysique,* 9(4):300–308, Oct./Dec. **1953.** figs., 11 refs. French and English summaries p. 300. **MH-BH**—The first chemical determination f O_3 in the atmosphere near the ground was made by HOUZEAU in 1858. Regular measurements ere made in Paris from 1875 to 1909. Spectrographic determinations began in Feb. 1913. The resent method which can be made automatic, uses a modified Bowen-Regener apparatus with the ollowing reaction: $O_3+2KI+H_2O \rightarrow O_2+2KOH+I_2$ and $I_2+2Na_2S_2O_3 \rightarrow Na_2S_4O_6+2NaI$. After ach determination the reaction chamber is automatically washed to remove all traces of iodine r iodide. The process is automatically recommenced. An electrolytic device permits recording. Circuits, apparatus, design and appearance are illustrated. Accuracy is very high except in the city where SO_2 affects electrolytic process and thus the calibration of the equipment. The automatic ecords shown were made in the country 30 km from Paris in July–Sept. 1953. (*Same item as* .1–119, Jan. 1955, *MAB.*) *Subject Headings:* **1. Ozone determination 2. Automatic ozone recorders 3. Val-Joyeux, France.**—*M.R.*

10E–133 551.508.952

Decker, Fred W., **Portable ozone spectrophotometer.** *Alaskan Science Conference, 2nd, Mt. McKinley National Park, Sept.* 4–8, 1951, *Proceedings,* p. 273–275, pub. [**1953?**]. 2 figs., 4 refs. **DWB**—A simple instrument which measures the comparative intensities of solar radiation at 3300 Å and 3110 Å, is described and recommended for use by the U. S. Weather Bureau or other services n establishing networks of O_3 measuring stations. The spectrophotometer is 5 ft long, 4.5 in. square and weighs 35 pounds complete with batteries. Calibration can be done on a clear day by comparison with an adjustable monochromator. Data obtained by rapid succession of observations ndicates accuracy within 5% for total O_3 content of atmosphere. *Subject Headings:* **1. Ozone spectrophotometers 2. Ozone networks.**—*M.R.*

10E–134 551.521.18:551.511.33

*Elsasser, W. M. and King, J. I., **Transmission data for the far infrared bands of carbon dioxide and ozone.** Utah. University. Dept. of Physics, Contract AF 19(122)-392, Technical Report No. 9, Sept. **1953.** 27 p. 11 figs., 6 tables, 23 refs. **MH-BH**—Report contains first part of study aimed at application of mathematical theory of radiative transfer (*see item* 5.1–165, Jan. 1954, *MAB*) to actual CO_2 and O_3 bands in the atmosphere. The appendix gives supplementary information on Ch. II of Report 6, namely on recent refinements of transmission functions and generalized absorption coefficients. Tables and graphs give transmissivity and absorption coefficient of CO_2 and O_3. (*Same item as* 5.9–158, Sept. 1954, *MAB.*) *Subject Headings:* **1. Radiative transfer 2. Infrared radiation 3. Carbon dioxide absorption coefficients 4. Ozone.**—*M.R.*

10E–135 551.510.41:551.510.534:551.515.8(71)

*Gowan, E. H. and Leppard, R. E., **Meteorological variations in the quantity of atmospheric ozone over Edmonton (lat. 53°34′N, long. 113°31′W).** *Canadian Journal of Physics,* 31(5):702–713, July **1953.** 8 figs., 3 tables, 11 refs. **DLC**—In order to determine the relation of ozone in the atmosphere to frontal passages, air masses, föhn (Chinook) winds, etc. observations were made at Edmonton (53°N) with a Dobson ozone spectrometer with direct sun, clear zenith and cloudy zenith sky observations, separately or in rapid succession if conditions warranted, during the period from Aug. 2, 1950 to Dec. 31, 1952. Ten day averages of ozone amount were compared with similar data for Oxford (same lat.) for 1926–30. Distribution of O_3 around a low pressure system in each season, and around a vigorous high pressure system (polar continental), a large Pacific air mass and a small slow moving air mass is shown in separate diagrams. Low values of O_3 are associated with flow of warm air from mid-continent or from the ocean in middle latitudes, into a low pressure area. High values are associated with cold polar air and subsidence, and the polar front runs to the line of demarcation between the below normal and above normal values. Low values usually extend 500 mi ahead of the cold front into the warm air mass. Highest average values occur in spring (March) and lowest in fall (Oct.) at both Edmonton and Oxford. (*Same item as* 5.5–78, May 1954, *MAB.*) *Subject Headings:* **1. Ozone data 2. Ozone-air mass relationships 3. Edmonton, Alberta.**—*M.R.*

10E–136 551.510.41:546.214

Harteck, P. and Dondes, S. (*both, Rensselaer Polytechnic Inst., Troy, N. Y.*), **Comments on the thermal decomposition of ozone.** *Journal of Chemical Physics,* N. Y., 21(12):2241, Dec. **1953.**

2 refs. **DWB**—Disagreement of experimental with theoretical data on the spontaneous therm decomposition of small amounts of O_3 in large amounts of O_2 is explained on the basis of oxyg recombination of O_3 catalysis on the walls of the experimental reaction chamber. This was prov by increasing surface area of chamber 100 fold by the addition of glass wool (reaction increased 3 t times as fast due to recombination of oxygen atoms in surface of glass wool). A correction shou also be made for heat released by decomposition of O_3 in initial stages raising temperature in g (*Same item as* 6.7–156, July 1955, *MAB.*) *Subject Heading:* **1. Ozone decomposition.**—*M.R.*

10E–137 551.521.326:551.593.55:551.510.5

Hulburt, E. O. (*Naval Res. Lab., Wash., D. C.*), **Explanation of the brightness and color of t sky, particularly the twilight sky.** *Optical Society of America, Journal*, 43(2):113–118, Feb. 195 7 figs., 2 tables, refs., 17 eqs. **DWB**—By use of the Rayleigh scattering theory for pure air, prima scattering and known upper air densities from rockets, the brightness of the zenith twilight sky w calculated and values were obtained two to four times greater than those observed at Sacramen Peak, N. Mex. (*J. Opt. Soc. Am.*, 42,353, **1952**). The attenuation of the atmosphere was observ to be twenty percent above that of the Rayleigh theory, and the ozone thickness was measured to about 2.2 mm. When the absorption of the Chappuis band of ozone in the visible spectrum w added to the Rayleigh theory, the calculated sky brightness came into agreement with observati for solar depression angles below the horizon from about 0° to 6°. For the sun below 7° the ca culated zenith sky brightness fell rapidly below the observed brightness, showing that prima scattering in the atmosphere about 60 km does not contribute appreciably to the brightness, as h long been known (*J. Opt. Soc. Am.*, 28, 227, **1938**). Calculation showed that during the day t clear sky is blue according to RAYLEIGH, and that ozone has little effect on the color of the daylig sky. But near sunset and throughout twilight ozone affects the sky color profoundly. For examp in the presence of ozone the zenith sky is blue at sunset and throughout twilight (as is observe the blue at sunset being due about $\frac{1}{3}$ to Rayleigh and $\frac{2}{3}$ to ozone, and during twilight wholly to ozon (*Same item as* 5.1–158, Jan. 1954, *MAB.*) *Subject Headings:* **1. Night airglow 2. Twilight ph nomena 3. Ozone layer.**—*Author's abstract.*

10E–138 551.521.17:546.2

Inn, Edward C. Y. and Tanaka, Yoshio (*U. S. A. F. Cambridge Research Center, Mass.*), **A sorption coefficient of ozone in the ultraviolet and visible regions.** *Optical Society of Americ Journal*, 43(10):870–873, Oct. **1953.** 3 figs., 15 refs. **DWB**—As an extension to previous measur ments on absorption coefficients of ozone in the vacuum ultraviolet, similar measurements ha been made in the near ultraviolet from the overlapping region at 2000 Å up to about 3500 Å and the visible from about 4000–7500 Å. The absorption coefficient measurements were made usi ozone gas obtained by direct vaporization from liquid ozone of high purity (at least 90–95%) a the optical densities measured with a Cary recording spectrophotometer with a 10-cm quartz a sorption cell. The method is essentially different from those used by previous investigators, e. photoelectric detectors instead of photographic, pure ozone instead of ozonized oxygen, and t absorption cell located at the exit slit instead of between the light source and entrance slit. T absorption coefficients obtained are somewhat consistently lower than those previously report by NY and CHOONG, hitherto considered the most reliable. (*Same item as* 5.7–99, *MAB.*) *Subj Headings:* **1. Ozone absorption coefficient 2. Ultraviolet spectrum.**—*Authors' abstract.*

10E–139 551.510.534:06 551.510.41:

International Symposium on Atmospheric Ozone, Univ. of Oxford, Sept. 2–4, 1952, **Proceeding** *International Union of Geodesy and Geophysics, Bulletin d'Information*, 2(2):295–322, April **195 DWB**—Lists members of International Ozone Commission and others who attended conference a presents comprehensive abstracts of papers by G. M. B. DOBSON, SIR CHARLES NORMAND, R. H. KA G. F. WALTON, R. M. GOODY, H. V. DUTSCH, A. W. BREWER and C. D. WALSHAW, and discussi at each symposium. The main headings for the discussion were: 1) Instruments and observati techniques; 2) vertical distribution of O_3; 3) photochemical theory of O_3 formation; 4) O_3 and t general circulation of the atmosphere; 5) O_3 and weather changes, and 6) O_3 and stratosphere te peratures. Conclusion was that O_3 variations are associated to a high degree with long-wa pattern of the atmosphere with ozone high in troughs and low in ridges. Whether advection vertical motion is the cause is not clear. (*Same item as* 4.11–94, Nov. 1953 and 5.9–110, Sept. 19 *MAB.*) *Subject Headings:* **1. Ozone conferences 2. Ozone photochemistry 3. Internation Symposium on Atmospheric Ozone, Univ. of Oxford, Sept. 2–4, 1952. I. I.U.G.G. Internation Ozone Commission.**—*M.R.*

10E–140 551.510.534(0

International Union of Geodesy and Geophysics. Association of Meteorology, Brussels, 19 **Symposium sur l'ozone atmosphérique du 30 août au 1 septembre.** [Symposium on Atmospher Ozone, Aug. 30–Sept. 1.] Its *Procès-Verbaux des séances. Mémoires et discussions.* pub. Brusse

Dec. 1953. p. 303–405. figs., tables, refs., eqs. **DWB, DLC**—Contains papers or abstracts of papers presented at the conference as follows:

Dobson, G. M. B., **Introductory remarks.** p. 303–304. [For abstract, *see* 7.3-145, March 1956, *MAB.*]

Chapman, S., **The photo-chemical theory of atmospheric ozone.** p. 305–306. 5 refs. [*See* 5E–189, May 1955, *MAB.*]

Götz, F. W., **Vertical distribution of ozone.** p. 307–308. 2 eqs.—A general explanation of the "Umkehr" effect. Influence of secondary scattering must be considered in order to determine the true ozone distribution.

Normand, Sir Charles, **The synoptic study of ozone and meteorological conditions.** p. 309–310. [*See* 7.6–107, June 1956, *MAB.*]

Regener, E., **Ozon in the Troposphäre.** [Ozone in the troposphere.] p. 311. [*See* 6.11–174, Nov. 1955, *MAB.*]

Tönsberg, E., **Ozone in high latitudes.** p. 312–314. 3 tables.—Monthly averages at Tromsö communicated for 1935–1949. Maximum, 3.04 mm in March and April; minimum, 1.67 mm in Dec. Sudden increases in Jan. usually occur with passing of deep cyclones. Values obtained at Spitsbergen from Sept. 1950 to April 1951 differ but slightly from Tromsö.

Tousey, R.; Watanabe, K.; Purcell, J. D. and Johnson, F. S., **The vertical distribution of ozone to 70 km.** p. 315.—Distribution determined from UV spectrum in the range 3400–2100 Å, photographed in recent flights. Maximum concentration, 0.11 mm/km at 26 km; exponentially decreases up to 2×10^{-5} mm/km at 70 km. Agrees with theoretical calculation, considering the reaction $O+O+M\rightarrow O_2+M$.

Walton, G. F., **The vertical distribution of ozone.** p. 316–322. 4 figs., 2 tables, eqs. [*See* 7.3–148, March 1956, *MAB.*]

Dütsch, H. U., **The photochemical theory of the atmospheric ozone as a means of investigating turbulence and circulation in the lower stratosphere.** p. 322–332. 2 figs., 2 tables, 3 eqs. [*See* 5E–190, May 1955, *MAB.*]

Paetzold, H. K., **Über die Möglichkeit der Benutzung von Mondfinsternissen zur Erfassung der vertikalen Ozonverteilung in verschiedenen Breiten.** [The use of lunar eclipses for the measurement of vertical ozone distribution at different latitudes.] p. 333–336. fig., table, 2 eqs. [*See* 7.3–147, March 1956, *MAB.*]

Reed, Richard J. and Julius, Anthony L., **A quantitative analysis of two proposed mechanisms for vertical ozone transport in the lower stratosphere.** [summary of 10E–96]

Brewer, A. W., **The variations of ozone and water vapour concentrations. The value of observations.** p. 338–345. 3 figs. [*See* 8.3–157, March 1957, *MAB.*]

Gowan, E. H., **The temperature of the ozonosphere if the main absorption is from 4,000 degree sun.** p. 346–348. table.—Vertical temperature distribution for nine layers from 11 to 55 km is computed for both summer and winter at lat. 50 and 65 N. Assumed ozone amount is 0.280 cm, distributed according to published curves, integrating separately the bands 2300 to 3300 Å, 5500 to 6500 Å and 9.6μ. Absorption by water vapor and CO_2 were considered.

Gowan, E. H., **The measurement of atmospheric ozone at Edmonton, Canada.** p. 349–350.—Short description of modifications made on an old photographic type ozone meter, using a photomultiplier. In addition a Dobson spectrophotometer was used for Edmonton, the first ozone station in Canada.

Fritz, Sigmund, **Ozone measurements during sudden ionospheric disturbances.** p. 351–359. 4 figs., table, 7 refs., 2 eqs. [*See* 7.6–100, June 1956, *MAB.*]

Ehmert, Alfred, **Gleichzeitige Messungen des Ozongehaltes bodennaher Luft an mehreren Stationen mit einem einfachen absoluten Verfahren.** [Simultaneous measurements of the ozone content of the air near the ground at several stations by means of a simple absolute method.] p. 260–371. 11 figs., 7 refs., eqs. [*Same as* 10E–106.]

Ungeheuer, H., **Über die Beziehungen des bodennahen Ozons zu atmosphärischen Vorgängen.** [On the relation of ozone near the ground to atmospheric processes.] p. 372–376. 2 figs. [*See* 6.11–166, Nov. 1955, *MAB.*]

Miyake, Y. and Sarunashi, K., **On the annual and meridional variation of atmospheric ozone.** p. 376. [*Summary of* 10E–87.]

Kay, R. H., **Some observations on the temperature-sensitive Huggins absorption bands of atmospheric ozone.** p. 377–383. 2 tables, 3 eqs. [*See* 7.3–146, March 1956, *MAB.*]

Dobson, G. M. B.; Normand, C. W. B. and Kay, R. H., **The determination of atmospheric ozone by measurements on moonlight.** p. 384–388. table. [*See* 7.3–132, March 1956, *MAB.*]

Vigroux, M., **Les coefficients d'absorption de l'ozone.** [Absorption coefficients of ozone.] p. 389–393. table.—A table with experimental results is presented, showing the absorption coefficient for ozone at 18°C from 3401 to 3038 Å and the relative absorption values for the temperatures −92, −75, −59, −44, −30, +50, +85 and +120°C from 3401 to 3130 Å. The coefficients do not depend on the ozone concentration, but the absorption maxima are temperature dependent.

Langer, R. M., **The combined absorption of oxygen and ozone.** p. 394–399. 2 figs., tab
4 eqs.—The equation $\alpha = 7.1 \times 10^{-5} f o_2 \frac{\rho}{\rho_0}\left(1 + 1.25 \frac{S}{S_0}\sqrt{\frac{T}{T_0}}\right)$ is considered to be more adequate
the absorption coefficient (α) of oxygen, than the Heilpern equation, which considers only fo_2 (m
fraction of O_2) and a power function of the pressure. ρ, T—density and pressure; index $_0$ at NT
A good agreement with measurements, made from 0.2 to 120 atmospheres, was found. Final
the attenuation coefficients for solar radiation are computed according to this and older equatio
showing a substantial disagreement.

Dobson, G. M. B., **Summary.** p. 400–401. [*See* 7.3–133, March 1956, *MAB.*]

Notes on a few of the discussions on p. 402–405. Discussions dealt mainly with instrumen
errors during ozone measurements, effects of a low sun and the determination of the extraterrestr
constant.

Subject Headings: **1. Ozone measurements 2. Photochemical theory of ozone 3. Ozone sympo
4. Symposium on Atmospheric Ozone, Brussels, 1951 5. Rocket soundings 6. Vertical ozo
distribution 7. Umkehr effect 8. Edmonton, Canada 9. Tromsö, Norway.**—*A.A.*

10E–141 551.524.7:551.510.5

Johnson, Francis S. (*U. S. Naval Research Lab., Wash., D. C.*), **High-altitude diurnal temperatu
changes due to ozone absorption.** *American Meteorological Society, Bulletin,* 34(3):106–110, Mar
1953. 5 figs., 14 refs. **DWB**—The heating effect due to absorption of solar energy by atmosphe
ozone was calculated from direct measurements of ozone concentrations and of the ultraviolet spect
intensity of sunlight made during a rocket flight over New Mexico on June 14, 1949. Assumin
constant rate of heat los throughout the day and night due to infrared emission, and no temperat
change from day to day, the diurnal temperature change was found to have maximum value
5.3°C at 48 km, falling to 1°C at 31 km and 70 km. (*Same item as* 4.11–164, Nov. 1953, *MA.*
Subject Headings: **1. Stratospheric temperatures 2. Ozone absorption 3. Rocket data 4. N
Mexico.**—*Author's abstract.*

10E–142 551.510.534:551.52

Kondrat'ev, K. Ia. and Matreshina, T. D., **O vliianii dlinnovolnovogo izlucheniia ozona
radiatsonnyĭ balans zemnoĭ poverkhnosti i atmosfery.** [Effect of long-wave radiation of ozone
the radiation balance of the earth and atmosphere.] *Leningrad. Glavnaia Geofizicheskaia
servatoriia, Trudy,* 41(103):125–132, **1953.** (Original unchecked)—The upward radiation flux at
upper boundary of the atmosphere and the downward flux at the earth's surface are computed
the spectral region 9.4–9.9μ which includes the principal long-wave band of ozone absorption. Af
comparing the calculated values of flux with amounts of total outgoing radiation at the up
boundary of the atmosphere and total effective radiation of the earth's surface, the authors conclu
that the effect of long-wave radiation of ozone upon the radiation of the earth's surface and the ea
as a whole is insignificant. In the computations, average vertical distributions of temperatu
pressure and ozone concentration are used. Absorption and emission of radiation by ozone a
water vapor are accounted for on the basis of a fairly comprehensive investigation of their absorpt
properties. *Subject Headings:* **1. Ozone absorption spectra 2. Long wave radiation absorption
ozone 3. Heat balance.**—*Referativnyĭ Zhurnal, Mekhanika, No. 6727, 1956.*

10E–143 551.510.534:551.510.41:546.

***†**Landolt, Hans H. and Börnstein, Richard, **Zahlenwerte und Funktionen aus Physik, Chem
Astronomie und Technik.** [Tables and functions in physics, chemistry, astronomy, geophysics a
technology.] 6th ed. Vol. 3, **Astronomie und Geophysik.** Berlin, Springer, **1952.** 795 p. tab
charts, figs., bibliogs. **DWB, DLC** (QC61.L3)—On p. 590–594 tables and graphs are presented
the absorption coefficient of ozone for UV radiation (2135.9–3525.8 Å), temperature effect u
Huggins and Chappuis bands, ozone transmissivity for infrared radiation, vertical and latitudi
ozone distribution, seasonal variations, and average amounts for each month of the period 19
1949 at Arosa and of 1935–1949 at Tromsö. Ozone-weather relationships are discussed and bi
ography of 30 items is added. (For fuller abstract, *see* 4.4–9, April 1953, *MAB.*) *Subject Headi
1. Ozone 2. Computation tables.*—*G.T.*

10E–144 551.508.952:551.508.

Murray, William D., **Flight testing and evaluation of an experimental ozonesonde.** N
York Univ. College of Engineering. Research Div., Contract AF 19(604)-873, Technical Re
263.02; Final Report, Dec. **1953.** 36 p. 8 figs. (some fold.), eqs. **MH-BH**—A flight test
evaluation program has been carried out with the aim of investigating the "Ozonesonde" syst
developed under a former program. The ozonesonde is a spectroscope coupled to the stand

adiosonde transmitter and uses the attenuation of solar ultraviolet energy by ozone absorption o measure distribution of this gas in the atmosphere. Five flight tests were performed during the rogram. The evaluation program was based on adaptability to mass production, ease of use in an perational program, and overall ability to accurately measure ozone. The instrument and modifica-ons made to it are reviewed; the evaluation presented; and recommendations for a continuing rogram submitted. *Subject Headings:* **1. Ozone meters 2. Ozonesondes.**—*Author's abstract.*

10E–145 551.508.952

Murray, William D., **Ozonesonde evaluation.** New York Univ. College of Engineering, Re-earch Div., Contract AF 19(604)-763, Project No. 263, Progress Report 263.01, May 1, 1953–uly 31, 1953. Aug. 6, **1953. DWB**—A program for flight test and evaluation of the ozonesonde nstrument developed under a previous contract has been initiated. A model of the unit developed reviously has been flight tested. Based on results of this flight the system was redesigned and everal models constructed. The new instruments have been calibrated and are being taken to lew Mexico for further flight tests. *Subject Heading:* **1. Ozonesondes.**—*Author's abstract.*

10E–146 551.510.41:546.214:551.558

Neuwirth, R., **Unterschiede im Luftaustausch einer Gipfel- und einer Hochtalstation nach-ewiesen durch Messungen des bodennahen Ozons.** [Differences in air exchange at a summit and t a high valley station shown by measurements of ozone near the ground.] *Meteorologische Rund-chau,* 6(11/12):201–204, Nov./Dec. **1953.** 5 figs., 19 refs. **DWB**—Incidence of maxima of surface zone content at St. Blasien (mountain valley, 785 m) and Feldberg (peak, 1500 m) in the Black orest, Oct. 1952–April 1953, shows systematic differences related to air motion. At Feldberg naxima occur most often at very cloudy or misty days with little or decreasing sunshine, at St. lasien on clear days with high or increasing sunshine. The ozone maxima at St. Blasien are attrib-ted to solar radiation, those at Feldberg to horizontal shearing accompanying a large-scale circula-on, which can overcome the destructive effect on ozone of high humidity. (*Same item as* 5.7–70, uly 1954, *MAB.*) *Subject Headings:* **1. Ozone variations 2. Vertical motion.**—*C.E.P.B.*

10E–147 551.508.952

New York University. College of Engineering. Research Div., **Ozonesonde development.** ontract AF 19(122)-238, Progress Report, No. 2–4, 6. Nov. **1950**–June 1, **1951,** Feb. 1, **1952.** lso: **Progress Report** 140-07, Oct. 1, **1952.** And: **Final Report** (and Technical Report 140-08), pril 14, **1953.** 6 pieces. illus. refs., eqs. **DWB**—A light-weight, expendable "Ozonesonde," an nstrument for measuring ozone in the atmosphere has been developed by the Research Division. he unit consists of a small photoelectric spectroscope, a radio transmitter, and a pressure modulator. t was designed for routine measurement of ozone distribution at altitudes to 150,000 ft from rawin-onde stations throughout the U. S. The methods investigated during the development are reviewed. ystems in use and those discarded are discussed. A description of operation and drawings of the zonesonde are included, as are a discussion of calibration and operational procedures and recom-nendations for use. (For abstract on Progress Report, No. 2, *see* 3.3–54, March 1952, *MAB.*) *ubject Heading:* **1. Ozonesondes.**—*Author's abstract.*

10E–148 551.510.534:551.547

Normand, Sir Charles, **Atmospheric ozone and the upper-air conditions.** *Royal Meteorological ociety, Quarterly Journal,* 79(339):39–50, Jan. **1953.** 12 figs., 19 refs. **DWB**—Daily measurements f ozone layer above Oxford are compared with 500–300 mb thickness and height of tropopause both reversed). Relations to source of air in long wave oscillations are illustrated by 300 mb ontours on days of high and low ozone content. Seasonal and latitude distribution of ozone and s vertical distribution are discussed in relation to advection and vertical divergence or convergence. Methods of survey are described, including Umkehr method. (*Same item as* 4.8–81, Aug. 1953, *IAB.*) *Subject Heading:* **1. Ozone variations.**—*C.E.P.B.*

10E–149 551.510.41:546.214(43)

Obenland, E., **Vergleichsmessungen des Ozongehalts in Oberstdorf und auf dem Nebelhorn.** Comparative measurement of ozone content in Oberstdorf and on the Nebelhorn.] *Germany. Deutscher Wetterdienst, Mitteilungen,* No. 3, Sept. **1953.** 15 p. 3 figs., 4 tables, 16 refs. **DWB**—Measurements of the ozone content of the atmosphere at Oberstdorf (770 m) and on the Nebelhorn (1832 m) carried out during July–September 1951 were made by means of the KI method. Measure-ents taken on seven days, during which the weather was marked by convective activity, were lected for analysis. Intensified convective exchange abolished the difference in ozone concentration etween these stations. A temporary reversal of ozone gradient is observed when the cumulus ondensation level is reached below the mountain station during intense convection. The decrease ozone concentration at the mountain level is not only caused by the upward transport of air with

low ozone content but also may be a result of condensation processes decreasing ozone conten The normal ozone stratification persisted during convection associated with west high pressu situations indicating that subsidence interferes with convective exchange. For the mountain well as for the valley observations of low ozone values were associated with high relative humidity an vice versa. (*Same item as* 5.8–87, Aug. 1954, *MAB.*) *Subject Headings:* **9. Ozone in troposphe 2. Ozone-humidity relationships 3. Oberstdorf, Germany 4. Nebelhorn, Germany.**—*I.L.D.*

10E–150 551.510.5

Paetzold, Hans-Karl, **The mean vertical ozone distribution resulting from the photochemic equilibrium, turbulence and currents of air.** *Journal of Atmospheric and Terrestrial Physic* 3(3):125–131, April **1953.** 6 figs., 2 tables, 23 refs. **DWB**—Vertical distribution and amount ozone are calculated on four assumptions of solar radiation of 2100 Å and spectral pressure coefficie of absorption by O_2. The average distribution is best fitted by ratio solar radiation/black body 2100 Å = 0.03 and O_2 absorption proportional to $p^{1.4}$, and by downward transport of ozone by tu bulent exchange, greatest at the equator. Double maximum sometimes found is attributed t accumulation in Arctic air masses which drift *S* losing height. (*Same item as* 4.8–82, Aug. 195 *MAB.*) *Subject Heading:* **1. Ozone distribution.**—*C.E.P.B.*

10E–151 551.510.5

*†Paetzold, Hans-Karl (*Max-Planck-Inst. Weissenau*), **Versuch einer Analyse der gemittelte vertikalen Ozonverteilung in verschiedenen geographischen Breiten.** [Attempt at analysis mean vertical ozone distribution in different geographical latitudes.] *Geofisica Pura e Applicat* 24:83–94, Jan./April **1953.** 6 figs., table, bibliog. p. 93–94. English summary p. 83. **DWB** Data for O_3 distribution with height calculated from balloon ascents in different latitudes, fro rocket flights at Albuquerque, N. Mexico, during solar eclipses at the equator and from the Umke effect (Tromsö 68°N) are tabulated, plotted and compared with the curves derived from the theo (based on the photochemical balance). The differences, below 23 km, are attributed to austaus which is greatest near the equator. A secondary O_3 max. (16 km) noticed especially in spring the sub-Arctic, is accounted for by advection from polar regions where the concentration is very hi at the end of the polar night. The greatest ozone concentration occurs at 60°N. (*Same item* 5.2–88, Feb. 1954, *MAB.*) *Subject Headings:* **1. Vertical ozone distribution 2. Ozone lay 3. Ozone in Arctic.**—*M.R.*

10E–152 551.510.534:541.

*†Paetzold, Hans-Karl, **Die vertikale Verteilung des atmosphärischen Ozons nach dem phot chemischen Gleichgewicht.** [Vertical distribution of atmospheric ozone by photochemical equ librium.] *Geofisica Pura e Applicata*, 24:71–82, Jan./April **1953.** 5 figs., 2 tables, bibliog. p. 8 English summary p. 71. **DWB**—The theory of photochemical formation and distribution of is reviewed with respect to absorption and emission by O_2 in various spectral regions with vario intensities of solar radiation. The vertical ozone distribution is then calculated for several parts the earth on the basis of the photochemical theory and the resulting temperature profile also c culated and shown graphically. The O_3 distribution with solar height $H_0 = 90°$, 45° and 20° is ne shown and then the measured O_3 distribution from balloon ascents at Stuttgart, Albuquerque, a Weissenau and during solar eclipses at the equator on two occasions (1931 and 1943). Finall as is demonstrated, the speed of the reactions which condition the ozone balance varies with te perature (and height) so that no certain knowledge of the ozone distribution can be obtained un more is known about the photochemical reactions which take place under varying conditions in t atmosphere—especially above 25 or 30 km. (*Same item as* 5.2–89, Feb. 1954, *MAB.*) *Subj Headings:* **1. Vertical ozone distribution 2. Ozone balance in stratosphere 3. Photochemistry upper atmosphere.**—*M.R.*

10E–153 551.510.5

Ramanathan, K. R. and Ramana Murthy, Bh. V., **Daily variation of amount of ozone in t atmosphere.** *Nature*, London, 172(4379):633–634, Oct. 3, **1953.** 2 figs., 2 tables, 5 refs. **DWB** Observations at Mount Abu and Ahmedabad, India, show a clear excess averaging 0.30 cm by nig over day. (*Same item as* 5.2–90, Feb. 1954, *MAB.*) *Subject Headings:* **1. Diurnal ozone variatio 2. India.**—*C.E.P.B.*

10E–154 551.510.5

*Ramanathan, K. R. and Kulkarni, R. N. (*Phys. Res. Lab., Ahmedabad*), **Height distribution atmospheric ozone.** *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):321–33 Feb. **1953.** 4 figs., 2 tables, 12 refs. **DLC**—Results of observations of height distribution of ozo made at Mt. Abu, North India with a Dobson spectrophotometer from Oct. 1951 to April 19 Ozone is negligible below 18 km, quite variable from 18–27 km and steady above 27 km. Compar

n data at Delhi, Kodaikanal, White Sands (N. Mex.), Arosa and Tromsö it is evident that ozone ends to lower levels at high latitudes. Ozone increases greatly with latitude, and is probably troyed by water vapor carried upward by convection. As it is formed by photochemical dis- ation of O_2 by sunlight, it is also wanting in the polar night. There is a high negative correlation n the height of tropopause. In subsidence areas (cold sinks) O_3 may be very great for long iods, just above inversion layer. (*Same item as* 5.1–111, Jan. 1954, *MAB.*) *Subject Heading:* **Ozone distribution.**—*M.R.*

10E–155 551.558.29:551.510.534

Reed, Richard J., **Large-scale eddy flux as a mechanism for vertical transport of ozone.** *Journal Meteorology*, 10(4):296–297, Aug. **1953.** 7 refs., 8 eqs. **DWB**—The instantaneous large-scale tical eddy flux of ozone near 10 km in mid-latitudes in winter is computed as about 10^{-11} gm/cm²/ nearly equal to vertical transfer by mean meridional motion. This is consistent with observed ximum ozone in winter in 50–60°N. (*Same item as* 5.2–186, Feb. 1954, *MAB.*) *Subject Headings:* **Ozone distribution 2. Vertical eddy flux.**—*C.E.P.B.*

10E–156 551.510.41:546.214

Renger, F. and Lucke, O., **Über die meteorologischen Bedingungen der Ozondichte in boden- ıer Luft.** [On the meteorological conditions of ozone density in air near the ground.] *Germany. utsche Demokratische Republik. Meteorologischer Dienst, Abhandlungen*, 2(13), **1953.** 44 p. figs., 39 tables, 49 refs. **DWB**—Two series of microchemical ozone measurements, with accom- ıying weather, UV radiation and air mass, by H. Cauer, 80 m above Weissbach valley floor 0 m, running SSW) in autumn 1941 and May 1942 are set out and analyzed. A diurnal variation s found in settled weather in May (max 22γ/m³ at 20 h, min 15 at 6 h) but not in Oct./Nov. one was high with dry air and with subsidence and föhn, low with moist air and with convection. g and drizzle brought an especially rapid decrease. Cyclones and anticyclones, turbulence, alls and air mass had no systematic effect. High values are associated with thunder. (*Same n as* 4.10–89, *MAB.*) *Subject Heading:* **1. Ozone measurements.**—*C.E.P.B.*

10E–157 551.510.53:551.557

Scorer, R. S., **Air motion in the upper atmosphere.** *Nature*, London, 172(4369):138–139, July **1953.** 5 refs. **DWB**—Account of meteorological problems raised at a discussion of physics of er atmosphere (*Physical Society*, London, Feb. 6, **1953**). Temperature shows a maximum in ne layer about 50 km and minimum at 80 km. Both ozone distribution and ionization in E layer gest large air motions but it is not yet clear whether these are winds in the usual sense or some m of wave motion. Variations are very great and are attributed to dominance of diurnal varia- ıs and greater size of convection elements than in troposphere. (*Same item as* 4.11–93, *MAB.*) *bject Headings:* **1. Ozone layer 2. E layer 3. Stratospheric winds.**—*C.E.P.B.*

10E–158 551.521.18:523.77

Shaw, J. H. and Howard, J. N. (*Ohio State Univ., Columbus*), **The ozone band near 4.7μ in the ar spectrum.** *Astrophysical Journal*, Chicago, 117(3):460–461, May **1953** table, foot-refs. C—Measurements made in the 4–5μ region of the infrared solar spectrum, with considerably her resolution than has been done before, are reported to have revealed many previously un- ntified weak lines. These are attributed to atmospheric ozone. This interpretation is claimed have been confirmed in laboratory measurements. Attention is called to the fact that "the sence of this ozone absorption precludes the identification of any of the lines of solar CO which ve been predicted to lie in this region." (*Same item as* 9B–74, *MAB.*) *Subject Headings:* **1. Solar ctrum 2. Infrared absorption spectrum 3. Ozone absorption.**—*G.T.*

10E–159 551.508.21:551.510.41:546.214

*Stair, Ralph (*Natl. Bureau of Standards, Wash., D. C.*), **Filter radiometry and some of its olications.** *Optical Society of America, Journal*, 43(11):971–974, Nov. **1953.** 3 figs., refs. **DWB** The use of filters to measure radiation accurately in definite bands (whether UV visible or infrared diation) is discussed and available types of filters and their characteristics outlined. The applica- n of filter radiometry to measurement of water vapor or O_3 absorption and results of use in measure- nt of total O_3 at Sacramento Peak, N. Mex. (June 1949) described and data tabulated and shown scatter diagrams. The measurements of stratospheric ozone thus presented were made with a anium phototube (Westinghouse) WL-775) with filters which give transmittance in the spectral ion from 3000 to 3400 Å of 25 to 60%. *Subject Headings:* **1. Filter radiometry 2. Ozone measure- nts 3. Titanium phototubes.**—*M.R.*

10E–160 551.510.41:546.214

Teichert, F., **Bericht über Ozonmessversuche mit Fluoreszein.** [Report of attempts of measur- ozone with fluorescein.] *Zeitschrift für Meteorologie*, 7(2):33–34, Feb. **1953.** 6 refs. **DWB**—

Report of unsuccessful attempts made in a laboratory with artificially ozonized oxygen. Appar and methods used are described. The method is not recommended for quantitative measurem of ozone in the lower layers of the atmosphere. (*Same item as* 5.1–107, Jan. 1954, *MAB.*) *Su Headings:* **1. Ozone measurement 2. Laboratory experiments 3. Fluorescein.**—*A.A.*

10E–161 551.510.534:551.5

Vassy, E. and Vassy, A., **Température moyenne de l'ozone atmosphérique.** [Mean t perature of atmospheric ozone.] *Indian Academy of Sciences, Proceedings, Sec. A*, Bangal 37(2):195–203, Feb. **1953.** 2 figs., 19 refs., 6 eqs. **DLC**—It is shown how the spectroscopic termination of ozone temperature in the stratosphere would make possible the regular observa of the mean temperature of the atmosphere up to 70 km or so, rather than to 30 km as can be with radiosondes; also the determination of the daily, seasonal, annual and regional variation temperature of the high atmosphere would be possible; more data are needed on the amount (de of ozone in the ozone layer. Laboratory spectroscopy of ozone by the authors has enabled the define ozone temperature (1936) and to make observations at several places in France and the (Mt. Blanc, Jungfraujoch, etc.) since 1935. (*Same item as* 5.1–112, *MAB.*) *Subject Headi* **1. Ozone spectroscopy 2. Ozonosphere temperature measurement techniques 3. Alps.**—*M.R.*

10E–162 551.510.41:546

*Zimmerman, G., **Kleinklimatische Ozonmessungen in Bad Kissingen.** [Microclimatic oz measurements in Bad Kissingen.] *Germany. Deutscher Wetterdienst, Mitteilungen*, No. 1, J **1953.** 11 p. fig., 10 tables. **DWB**—Ozone measurements near the ground were made on d days comparing the conditions on a street, meadow or field, in a park, forest, etc. Ozone con sharply decreases with an increasing concentration of exhaust gases, increases with wind speed decreases with relative humidity. There was no indication that ozone is partly produced near earth's surface on the sharp ends of grasses, needles, etc. as assumed by CAUER, but it is more li that ozone is transported downwards from the stratosphere. (*Same item as* 5.7–71, *MAB.*) *Su Headings:* **1. Ozone near the ground 2. Microclimatic ozone measurements 3. Bad Kissin Germany.**—*A.A.*

PART III. REVIEWS, TRANSLATIONS, RECENT MONOGRAPHS, AND ANALYTICS FROM SERIALS AND COLLECTED WORKS

Note: Material listed in these sections will not be included in the monthly indexes until abstracted. The item number is mentioned for those titles which have been abstracted in previous issues of **Meteorological Abstracts and Bibliography.**

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Tsepelev, N. V.: **Ob otrazhenii uprugikh voln v neodnorodnoĭ srede,** [Reflection of elastic waves in a non-uniform medium], p. 11–17

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Skugarevskaia, O. A.: **Raschet konechnoĭ stadii protsessa stanovleniia elektricheskogo polia v trekhsloĭnoĭ srede,** [Calculation of the final stage of the process of establishment of an electric field in a 3-layered medium], p. 59–72

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Vinogradov, P. A.: **Izmerenie vertikal'noĭ sostavliaiushcheĭ elektrotellurichеskogo polia v oz. Baĭkal,** [Measurement of the vertical component of the electrotelluric field in Lake Baikal], p. 83–86

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Iokhel'son, S. V. and Shitov, E. F.: **Radiometricheskiĭ analiz gornykh porod po spektru gamma-izlucheniia,** [Radiometric analysis of rocks according to the gamma-radiation spectrum], p. 96–104

Gezentsveĭ, A. N.: **O zavisimosti koeffitsienta gorizontal'nogo makroobmena v more ot perioda osredneniia pul'satsiĭ skorosti techeniia,** [The dependence of the coefficient of horizontal macro-exchange in the sea on the averaging period current velocity fluctuations], p. 105–107

Ivanov-Kholodnyĭ, G. S.: **O raketnykh issledovaniiakh korotkovolnovoĭ radiatsii Solntsa,** [Rocket studies of the short-wave radiation of the sun], p. 108–121

Kachurin, L. G.: **Sravnenie razlichnykh uravneniĭ zamerzaniia pereokhlazhdennykh vodnykh aerozoleĭ,** [Comparison of various equations of freezing of supercooled aqueous aerosols], p. 122–130

Shifrin, K. S. and Minin, I. N.: **Negorizontal'naia vidimost' pri sploshnoĭ oblachnosti,** [Nonhorizontal visibility with continuous cloud cover], p. 131–138

Safronov, V. S.: **O pervonachal'noĭ temperature Zemli,** [The primordial temperature of the earth], p. 139–143

Volarovich, M. P. and Parkhomenko, E. I.: **Modelirovanie sviazi vozmushcheniia elektricheskogo polia gornykh porod pri p'ezoelektricheskom effekte s seĭsmicheskimi iavleniiami,** [Representing the relationship between disturbances of the electric field of rocks in the presence of the piezoelectric effect and seismic phenomena], p. 144–145

Fedynskiĭ, V. V.: **O razrabotke apparatury dlia gravimetricheskikh izmereniĭ v dvizhenii,** [The development of an apparatus for gravimetric measurements in motion], p. 146–152

Rykov, A. V.: **Fotoelektricheskiĭ pribor dlia zapisi potoka energii seĭsmicheskikh voln,** [Photoelectric device for recording the energy flux of seismic waves], p. 153–158

Shakurov, P. F.: **Vysokochuvstvitel'nye apparatury dlia opredeleniia naklonov, poverkhnosti zemli i registratsii voln zemletriaseniĭ,** [Highly sensitive apparatus for determining declivities of the earth's surface and recording earthquake waves], p. 159–161

Bocharov, E. I.: **Pogloshchenie radiatsii vlazhnym vozdukhom: opticheskiĭ gigrometr,** [Abs
tion of radiation by moist air: optical hygrometer], p. 162–169
Fel'dshteĭn, Ia. I.: **Raspredelenie poliarnykh siianiĭ v okolopoliusnoĭ oblasti,** [The distribu
of auroras in the circumpolar region], p. 170–171

No. 2, Feb. 1959

Berzon, I. S.; Vasil'ev, Iu. I. and Starodubrovskaia, S. P.: **O prelomlennykh volnakh, s
vetstvuiushchikh vodonosnym peskam, II,** [Refractive waves corresponding to wa
bearing sands, Pt. 2], p. 177–182
Savarenskiĭ, E. F.: **Ob opredelenii kazhushchikhsia skorosteĭ seĭsmicheskikh voln na Kavk**
[Determination of apparent seismic wave velocities in the Caucasus], p. 183–188
Klushin, I. G.: **O vydelenii geofizicheskikh anomaliĭ, men'shikh srednekvadratichnoĭ po
shnosti izmereniia,** [The segregation of geophysical anomalies: least mean square e
of measurements], p. 188–196
Melamud, A. Ia.; Khudzinskiĭ, L. L. and Deĭnega, S. A.: **Stantsiia promezhutochnoĭ magni
zapisi seĭsmicheskikh kolebaniĭ,** [Stations for intermediate magnetic recording of sei
waves], p. 197–209
Ivakin, B. N.: **Uprugie sredy s neideal'noĭ inertsionnost'iu i ikh modeli,** [Elastic media
nonideal inertia and their models], p. 210–220
Silaeva, O. I.: **Metodika izucheniia uprugikh svoĭstv obraztsov gornykh porod pod davlen
[Method of studying elastic properties of rock samples under pressure], p. 221–228
Konstantinova, A. G.: **O dinamike vnezapnykh vybrosov uglia i gaza v shakhtakh po dan
seĭsmoakusticheskikh nabliudeniĭ,** [The determination of the dynamics of sudden e
tions of coal and gas in mine shafts from seismo-acoustic observations], p. 229–241
Pertsev, B. P.; Pariĭskiĭ, N. N. and Kramer, M. V.: **Sravnenie razlichnykh metodov garm
cheskogo analiza prilivnykh deformatsiĭ Zemli,** [Comparison of various methods of
monic analysis of tidal earth deformations], p. 242–243
Strakhov, V. N.: **K teorii dvumernoĭ zadachi magnitorazvedki,** [Theory of the two-dimensi
problem in magnetic surveying], p. 244–253
Ratser- Ivanova, F. S., **Opredelenie periodov svobodnykh kolebaniĭ sutochnogo i polusutoch
tipov v poliarnykh moriakh,** [Determination of the period of free oscillation of the diu
and semi-diurnal types in polar seas], p. 254–261
Balabanova, V. N.; Bibilashvili, N. Sh.; Kartsivadze, A. I. et al.: **Opyty po vozdeĭstviiu
kuchevuiu oblachnost' v Alazanskoĭ doline,** [Experiments on influencing cumulus cl
in the Alazan Valley], p. 262–275
Solodikhina, L. D.: **Ob estestvennoĭ radioaktivnosti atmosfernykh osadkov,** [Natural ra
activity of atmospheric precipitation], p. 276–283
Sulakvelidze, G. K.: **Uravnenie teploprovodnosti poristykh sred, soderzhashchikh nasyshche
par, vodu ili led,** [Thermal conductivity equation of porous media containing satur
vapor, water, or ice], p. 284–287
Mikirov, A. E.: **O malykh uglakh indikatrisy rasseianiia,** [Small angles of the scattering ind
p. 288–295.
Vinogradov, S. D.: **Uprugie impul'sy, voznikaiushchie v massive pod davleniem,** [El
impulses appearing in a saline massif under pressure], p. 296–300
Kazinskiĭ, V. A.: **Interpoliatsionnye polinomy v primenenii k issledovaniiu figury Zemli,**
terpolation polynomes for the study of the configuration of the earth], p. 301–303.
Zevakina, R. A.: **Bukhtoobraznye vozmushcheniie geomagnitnogo polia i sviazannye s
izmeneniia v ionosfere po nabliudeniiam v Murmanske,** [Bay-like disturbances of
geomagnetic field and associated changes in the ionosphere according to observation
Murmansk], p. 304–310
Timofeev, A. N. and Bellavin, O. V.: **O gravimetricheskom i magnitometricheskom peresecl
Tagil'sko-Magnitogorskogo sinklinoriia Urala,** [Gravimetric and magnetometric i
section of the Tagil'-Magnitogorsk synclinorium of the Urals], p. 311–315
Petkevich, G. I.: **K izucheniiu uprugikh svoĭstv gornykh porod Predkarpat'ia,** [Investig
of the elastic properties of rock in the pre-Carpathian area], p. 316–319
Romaniuk, V. A.: **O vozmushcheniiakh sily tiazhesti atmosferoĭ,** [Disturbance of gravit
the atmosphere], p. 320
Boliunova, A. D. and Morozov, V. M.: **O fotoelektricheskikh izmereniiakh svecheniia noch
neba,** [Photoelectric measurements of the light of the night sky], p. 321–325
Ziuzin, A. S.: **Kharakter temperaturnogo polia v gorode i iavlenie anomal'noĭ bokovoĭ refra
[Characteristics of the temperature field in a city and anomalous lateral refraction], p.
329

Makhotkin, L. G.: **O formule Ts. G. Breĭdo dlia predel'nogo zariada kapel',** [The Breido formula for the ultimate charge of drops], p. 330–331

Kazanskiĭ, K. V.: **Zavisimost' pokazatelia prelomleniia vozdukha ot vlazhnosti,** [Dependence of atmospheric refraction index on humidity], p. 332–334

No. 3, March 1959

Skuridin, G. A.: **Printsip Diuamelia i asimptoticheskie resheniia dinamicheskikh uravneniĭ teorii uprugosti, II,** [The Duhamel principle and asymptotic solutions of dynamic equations in the elasticity theory, Pt. 2], p. 337–343

Riznichenko, Iu. V. and Shamina, O. G.: **Ob uprugikh volnakh v sloiakh konechnoĭ tolshchiny (po issledovaniiam na dvumernykh modeliakh),** [Elastic waves in layers of finite thickness (according to investigations on two-dimensional models)], p. 344–360

Epinat'eva, A. M. and Ivanova, L. A.: **Primenenie vysokochastotnykh fil'tratsiĭ dlia podavleniia mnogokratnykh otrazhennykh voln,** [The use of high-frequency filtration for the repression of multiple reflected waves], p. 361–371

Savarenskiĭ, E. F. and Aĭvazov, I. V., **Ob opredelenii azimutov i uglov vykhoda seĭsmicheskoĭ radiatsii,** [Determination of azimuths and angles of emission of seismic radiation], p. 372–381

Petrova, G. N. and Ismail-Zade, T. A.: **Ispol'zovanie parametrov stabil'nosti dlia detal'noĭ korreliatsii razrezov,** [Use of stability parameters in the detail correlation of cross sections], p. 382–397

Lozinskaia, A. M.: **Strunnyĭ gravimetr dlia izmereniia sily tiazhesti na more,** [String gravimeter for measuring the force of gravity at sea], p. 398–409

Driving, A. Ia.: **O perlamutrovykh oblakakh,** [Mother-of-pearl clouds], p. 410–421

Levin, L. M.: **O kriticheskom osazhdenii chastits aerozolia iz viazkogo potoka na prepiatstviia,** [Critical deposition of aerosol particles from a viscous current on obstacles], p. 422–431

Nemchinov, S. V.: **Kratkosrochnyĭ prognoz polia atmosfernogo davleniia dlia trekhsloĭnoĭ modeli atmosfery,** [Short range forecast of the atmospheric pressure field for a three-layered model of the atmosphere], p. 432–444

Kabuzenko, S. N., **K teorii temperaturnykh deformatsiĭ zemnoĭ poverkhnosti,** [Theory of thermal deformations of the earth surface], p. 445–449

Radzhabov, M. M., **O tochnosti opredeleniia granichnykh skorosteĭ po sisteme nagoniaiushchikh poperechnykh godorgrafov prelomlennykh voln, II,** [The accuracy of determinations of velocity limits according to the system of fitted transverse hodographs of breaking waves, Pt. 2], p. 450–459

Gus'kova, E. G., **Paleomagnitnye issledovaniia osadochnykh porod iugo-vostochnoĭ Turkmenii,** [Paleomagnetic investigations of sedimentary rock in southeastern Turkmenistan], p. 460–464

Zharkov, V. N.: **Temperatura plavleniia obolochki Zemli i zheleza pri vysokikh davleniiakh,** [Melting temperature of the earth's crust and iron at high pressures], p. 465–470

Pasechnik, I. P.: **Dlinnoperiodnye vozdushnye volny, voznikaiushchie pered grozami,** [Long-period air waves preceding thunderstorms], p. 471–475

Sen'ko-Bulatnyĭ, I. N.: **Neĭtronometria skvazhin na mestorozhdeniiakh margantsa i boksitov,** [Neutronometry of bore holes in beds of manganese and bauxite], p. 476–479

Mordukhovich, M. I.: **Lokal'nyĭ akusticheskiĭ metod izmereniia temperatury vozdukha,** [Local acoustical method of measuring air temperatures], p. 480–488

Gubin, V. I.; Dzhordzhio, V. A.; Petrosiants, M. A. and Romanov, N. N., [Review of **Kibel', I. A.: Vvedenie v gidrodinamicheskie metody kratkosrochnogo prognoza,** [Introduction to hydrodynamic methods of short-range forecasting], p. 489–492

Troitskaia, V. A.: **V Assambleia Spetsial'nogo komiteta po Mezhdunarodnomu geofizicheskomu godu,** [Fifth Assembly of the Special Committee for the International Geophysical Year], p. 493–502

Savarenskiĭ, E. F.: **IV Mezhdunarodnaia konferentsiia Vengerskogo geofizicheskogo obshchestva,** [International Conference of the Hungarian Geophysical Society], p. 502–504

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Budyko, M. I.: **O teplovom balanse zhivykh organizmov,** [Heat balance of living organisms], p. 29–35

Feldman, Ia. I.: **Rol' ravninnogo rel'efa i pribrezhnykh nizmennosteĭ v obrazovanii mestnoĭ pogody,** [Role of plane profiles and coastal depressions in the development of local weather], p. 82–85

Kemmerikh, A. O.: **Stok rek severnogo, Pripoliarnogo i Poliarnogo Urala,** [Runoff in the ri of the northern, subpolar and polar Urals], p. 85–90
Vinogradov, B. V.: **Poligonal'naia kompleksnost' pochv i rastitel'nosti v landshchaftakh suk stepi Severnogo Kazakhstana,** [Polygonal complexity of soils and vegetation in the steppe regions of northern Kazakhstan], p. 90–98
Dolgushin, L. D.: **Mezhdunarodnyĭ simpozium po fiziki dvizheniia l'da v lednikakh,** [In national Symposium on the Physics of Glacier Ice Movement], p. 141–145

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Obedientova, G. V.: **Noveĭshie tektonicheskie dvizheniia i geomorfologicheskie usl srednego Povolzh'ia,** [Recent tectonic movements and geomorphological conditions in central Volga region], 99 p.

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Vol. 74, 1958

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Vol. 76, 1958

Kaletskaia, M. S. and Miklukho-Maklaĭ, A. D.: **Nekotorye cherty chetvertichnoĭ istorii tochnoĭ chasti Pechorskogo basseĭna i zapadnogo sklona poliarnogo Urala,** [Some cha teristics of the Quaternary history of the eastern portion of the Pechora Basin and the wes slope of the polar Urals], 66 p.

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Wilson, J. Tuzo: **Geophysical institutes of the U.S.S.R. and of the People's Republic of Ch** p. 3–24
Akademiia Nauk SSSR: **Izvestiia, Ser. Geofizicheskaia, Jan. 1957–Sept. 1957** [listin translated titles in English], p. 28–31
Notes and personalia, p. 32–37
Union, section, and committee activities, p. 38
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Special announcements, p. 40
IGY Bulletin, No. 19, Jan. 1959, p. 41–56, (*For titles in this section see under* **IGY Bull** Pt. III, p. 468, March 1959 **MAB**)
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Cramer, H. E.: **A brief survey of the meteorological aspects of atmospheric pollution,** p. 165
Munn, R. E.: **Engineering meteorology: the weathering of exposed surfaces by atmosph pollution,** p. 172–178
Jacobs, Woodrow C.: **Meteorology applied is a social affair,** p. 179–181
Krueger, Daniel W.: **A relation between the mass circulation through hurricanes and t intensity,** p. 182–189
Longley, Richmond W.: **Observations on a wind anomaly near the earth's surface,** p. 190
Ives, Ronald L.: **An early report of abnormal refraction over the Gulf of California,** p. 192

Beiträge zur Physik der Atmosphäre, Frankfurt a.M., Vol. 31, No. 3/4, 1959

Koschmieder, H.: **[Biographical sketch of Heinrich von Ficker, Nov. 22, 1881–April 29, 19** p. 141–146

Lyra, G.: **Bemerkungen über eine gewisse Klasse nicht-konstanter Anströmprofile beim Leewellenproblem,** [Notes on a certain class of non-constant current profiles in connection with the lee wave problem], p. 147–151

Merbt, H.: **Solution of the two-dimensional lee wave equation for arbitrary mountain profiles, and some remarks on the horizontal wind component in mountain flow,** p. 152–161

Hollmann, Günther: **Transformation der Grundgleichungen der dynamischen Meteorologie in Koordinaten der stereographischen Projektion zum Zwecke der numerischen Vorhersage,** [Transformation of the basic equations of dynamic meteorology into stereographic projection coordinates for numerical forecasting purposes], p. 162–176

Hollmann, Günther: **Der thermodynamische Wirkungsgrad der atmosphärischen Zirkulation,** [The thermodynamic efficiency of atmospheric circulation], p. 177–188

Kuo, H. L.: **Application of energy integrals to thermally driven motions,** p. 189–199

Hollmann, G. and Wegner, K. O.: **Approximative Berechnung der Vertikalbewegung ausgewählter Wetterlagen,** [Approximate calculations of vertical motions in selected weather situations], p. 200–216

Flohn, H.; Holzapfel, R. and Oeckel, H.: **Untersuchungen über die stratosphärische Ostströmung auf der Sommerhalbkugel,** [Investigations of the stratospheric easterlies in the summer hemisphere], p. 217–243

Jacobi, W.; Schraub, A.; Aurand, K. and Muth, H.: **Über das Verhalten der Zerfallsprodukte des Radons in der Atmosphäre,** [Behavior of decay products of radon in the atmosphere], p. 244–257

Wegener, Kurt: **Die Strahlungskonstante der nicht-schwarzen Welt,** [The radiation constant of the non-black world], p. 258–261

Barthelt, H. P. and Ruppersberg, G. H.: **Die mechanische Windfahne, eine theoretische und experimentelle Untersuchung, Teil II,** [The mechanical windvane: a theoretical and experimental investigation, Pt. 2], p. 262–276

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Gherzi, E.: **Some remarks concerning the forecasting of the location, the structure and the turbulence of a jet stream,** p. 3–15

Demers, Pierre: **Quelques aspects du rayonnement cosmique en géophysique,** [Some aspects of cosmic radiation in geophysics], p. 16–20

Murphy, V. J. and Rockett, T. J.: **A shallow-zone seismic refraction study,** p. 34–37

Radiation solaire, septembre 1958 à février 1959, [Solar radiation September 1958 to February 1959], p. 38

Buist, M.: **Bulletin sismologique, septembre 1958 à février 1959,** [Seismological bulletin September 1958 to February 1959], p. 39–52

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Das, Sisir Chandra: **On the general plane problem of plasticity and its geophysical significance,** p. 63–74

Vol. 37, No. 4, April 1959

Woodside, William: **Water vapor permeability of porous media,** p. 413–416

McLaren, E. H.: **Intercomparison of 11 resistance thermometers at the ice, steam, tin cadmium, and zinc points,** p. 422–432

Pounder, E. R. and Little, E. M.: **Some physical properties of sea ice, Pt. 1,** p. 443–473

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Jeffreys, Harold: **On the interpretation of Pd,** p. 191–197

Hidaka, Koji and Nagata, Yutaka: **Dynamical computation of the equatorial current system of the Pacific, with special application to the equatorial undercurrent,** p. 198–207

Benioff, Hugo and Press, Frank: **Progress report on long period seismographs,** p. 208–215

Knopoff, Leon and MacDonald, Gordon J. F.: **The magnetic field and the central core of the earth,** p. 216–223

Irving, E.: **Palaeogeographic reconstruction from palaeomagnetism,** p. 224–237

Gutenberg, B.: **Caustics produced by waves through the earth's core,** p. 238–248

Hales, A. L.: **Geophysics in South Africa,** p. 249–256

Pekeris, C. L.: **Geophysics, pure and applied,** p. 257–262

Ratcliffe, J. A. et al.: **Transition from the ionosphere to interplanetary space: geophysical discussion of the Royal Astronomical Society, Feb. 21, 1958,** p. 263–266

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Usami, T.: **Elastic waves in a homogeneous and isotropic medium generated from a sphero origin,** p. 1–9

Usami, T.: **Elastic waves generated from a spheroidal cavity whose wall is subjected to nor stress of harmonic type, Pt. 2,** p. 11–36

Bundgaard, R. C.: **Air power,** p. 36–44

Mohri, K.: **Jet streams and upper fronts in the general circulation and their characteris over the Far East, Pt. 1,** p. 45–126

Időjárás, Budapest, Vol. 62, No. 4, July/Aug. 1958

Parczewski, Wladyslaw: **Intensity of precipitation and frequency of electric discharges thunderstorms,** p. 189–194

Höhne, Werner: **Technische Hilfsmittel bei mikrometeorologischen Temperaturmessungen Thermoelementen,** [Auxiliary devices for micro-meteorological temperature measurem using thermocouples], p. 195–206

Péczely, György: **A Balaton hatása a nedvesség és hőmérséklet alakulására,** [Influenc Lake Balaton on the development of humidity and temperature], p. 207–212

Hajósy, Ferenc: **Párhuzamos csapadékmérések a Meteorológiai Intézet műszerkertjéb** [Simultaneous precipitation measurements in the instrument yard of the Meteorolog Institute], p. 212–219

Ozorai, Zoltán: **Még egyszer a frontokról és légtömegekről,** [Further remarks about fronts air masses], p. 220–223

Baur, Franz: **Magyarországi nyárközepek szárazsága két évvel a szélsőséges napfolttevéke ségek előtt,** [Mid-summer drought in Hungary two years before extreme solar activi p. 223–224

Berkes, Zoltán: **A Drogajcev-féle csapadékelőrejelzés beválása,** [Drogaitsev's precipita forecast correct], p. 225

Baur, Franz: **Druckanstieg in hohen Luftschichten bei zunehmender ultravioletter Strahl** [Pressure increase in upper layers of the atmosphere with increasing UV radiation], p. 2 228

Mezősi, Miklós: **A sferics meteorológiai alkalmazásáról,** [Use of sferics in meteorolo p. 228–230

Szakály, József and Szilágyi, Tibor: **A valódi horizontról,** [On the true horizon], p. 231–23

Tänczer, Tibor: **Hegyek hatásának figyelembevétele a nyomásmező előrejelzésénél,** [Acco ing for mountain effects in forecasting the pressure field], p. 233–235

Pápai, László: **A nedvességmérés aerológiai kérdései,** [Aerological problems of humi measurement], p. 235–238

Tóth, Pál: **Két különböző térképvetület mechanikus átrajzolhatóságának elvi alapjai,** [H ciples of mechanical transcription of two different map projections], p. 238–241

Vol. 62, No. 5, Sept./Oct. 1958

Takács, Lajos: **Umrechnung der registrierten Sonnenscheindauer auf den idealen Horiz** [Reduction of recorded sunshine duration to an ideal horizon], p. 249–260

Mándy, György and Kárpáti, István: **Fafajok rügyfakadási hőigényének meghatároz** [Determining the heat requirement of trees for budding], p. 261–266

Flórián, Endre: **A légköri rádioaktivitás mérésének egyes eredményeiről,** [Some result atmospheric radioactivity measurements], p. 266–274

Predmerszky, Tibor: **A légkör rádioaktív szennyeződésének közegészségügyi vonatkoz** [Public health effects of the radioactive pollution of the atmosphere], p. 275–281

Donászy, Ernő: **Halpusztulás az Atkai Holt-Tiszán és ennek időjárásélettani jelentős** [Dying of fish in a stagnant branch of the Tisza near Atka, and its meteorobiolo significance], p. 284–289

Pápai, László: **A hajszálas higrométerek nedvességfelvétele,** [Moisture capacity of hygrometers], p. 290–293

Péczely, György: **A szárazsághajlam évi járása és szingularitásai Magyarországon,** [An variation and singularities of drought tendency in Hungary], p. 294–297

Ambrózy, Pál: **Frontálzónák hatásának figyelembevétele a nyomás és vertikális sebe numerikus előrejelzésében,** [Accounting for frontal zone effects in numerical forecas of pressure and vertical velocity], p. 297–300

Hille, Alfréd: **Megjegyzések a "futóáramlás" szóról,** [Note on the word "jet stream"], p. 302

Zigun, V. P.: **A meteorológiai szolgálat átszervezése Nagybritanniában,** [Reorganization of the meteorological service in Great Britain, (translation by I. Bodolai from the Russian)], p. 302–304

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Antoine, John W.: **Seismic studies in the western Caribbean,** p. 73–75 (i.e., p. 1–3 of the Reprint issue)
Van Allen, James A. and Frank, Louis: **Van Allen radiation belt,** p. 75–78 (i.e., p. 3–6)
Knauss, John A. and Pepin, Robert: **Measurements of the Pacific equatorial counter-current,** p. 78–79 (i.e., p. 6–7)
Epstein, Samuel and Sharp, Robert P.: **Oxygen istope studies,** p. 81–84 (i.e., p. 81–84)
Teweles, Sidney: **Structure and circulation of the stratosphere,** p. 84–88 (i.e., p. 12–16)
IGY bibliographic notes (*eighth in the series*), p. 88 (i.e., p. 16)

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Stocks, Percy: **Air pollution and cancer mortality in Liverpool Hospital region and North Wales,** p. 1–13
Commins, B. T.: **Polycyclic hydrocarbons in rural and urban air,** p. 14–17
Phair, John J.; Carey, Geoffrey C. R.; Shephard, Roy J. and Thomson, Maurice L.: **Some factors in the design, organization and implementation of an air hygiene survey,** p. 18–30
Sheppard, P. A.: **The effect of pollution on radiation in the atmosphere,** p. 31–43
Benton, D. P.; Elton, G. A. H.; Peace, E. A. and Picknett, R. G.: **Coalescence of droplets in aqueous-disperse aerosols,** p. 44–50
Haagen-Smit, A. J. and Brunelle, Margaret F.: **The application of phenolphthalein reagent to atmospheric oxidant analysis,** p. 51–59
Meade, P. J. and Pasquill, F.: **A study of the average distribution of pollution around Staythorpe,** p. 60–70
Lucas, D. H.: **The atmospheric pollution of cities,** p. 71–86
Stewart, N. G.; Gale, H. J. and Crooks, R. N.: **The atmospheric diffusion of gases discharged from the chimney of the Harwell reactor BEPO,** p. 87–102
Gale, H. J. and Peaple, L. H. J.: **A study of the radon content of ground-level air at Harwell,** p. 103–109
Graham, J. R.: **Smoke pollution and household costs,** p. 110–113
Oddie, B. C.: **Atmospheric chemistry,** p. 114–119
Nonhebel, G.: **The technical provisions of the British clean air act,** p. 120–138

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Lapworth, Charles F.: **Evaporation from the water surface of a reservoir,** p. 7–11
Makkink, G. F.: **The application of research on evaporation in hydrology,** p. 12–14
Kasser, P.: **Sur l'indice d'évaporation du bassin versant Alpin de Mattmark,** [Evaporation index of the Mattmark Alpine basin], p. 15–17
Linsley, Ray K.; Blaney, Harry F.; Harbeck Earl G. and Kohler, Max A.: **Research on evaporation and evapotranspiration in the United States,** p. 18–20
Blaney, Harry F.: **Evaporation and evapotranspiration studies United States Department of Agriculture in the Pacific Southwest,** p. 21–25
Friedrich, W.: **Methodology of evaporation research in Germany: present status and future tasks,** p. 26–29

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Van Allen, James A.; McIlwain, Carl E. and Ludwig, George H.: **Radiation observations with satellite 1958ε,** p. 271–286
Reber, Grote: **Radio interferometry at three kilometers altitude above the Pacific Ocean, Pt. 1, Installation and ionosphere,** [and] **Pt. 2, Celestial sources,** p. 287–303
Matsushita, S.: **A study of the morphology of ionospheric storms,** p. 305–321
Brown, Robert R.: **Excess radiation at the Pfotzer maximum during geophysical disturbances,** p. 323–329

Woodbridge, David D.; Macdonald, Norman J. and Pohrte, Theodore W.: **An apparent relat ship between geomagnetic disturbances and changes in atmospheric circulation at millibars,** p. 331–341
Charles, B. N.: **On some limitations of upper wind records,** p. 343–346
Vonnegut, Bernard; Moore, Charles B. and Botka, Alexander T.: **Preliminary results o experiment to determine initial precedence of organized electrification and precipit in thunderstorms,** p. 347–357
Knopoff, Leon: **Velocity of sound in two-component systems,** p. 359–361
Schroeder, Elizabeth; Stommel, Henry; Menzel, David and Sutcliffe, William, Jr.: **Clin stability of eighteen degree water at Bermuda,** p. 363–366
Moore, David G. and Shumway, George: **Sediment thickness and physical properties: Pi Point Shelf, California,** p. 367–374
Itagaki, K.: **An improved radio snow gage for practical use,** p. 375–383
Raja Rao, K. S.: **On the seat of the L currents causing geomagnetic tides,** p. 384–385
de Vries, D. A. and Philip, J. R.: **Temperature distribution and moisture transfer in po materials,** p. 386–388

Vol. 64, No. 4, April 1959

Warwick, James W.: **Some remarks on the interaction of solar plasma and the geomag field,** p. 389–396
Dessler, A. J.: **Ionospheric heating by hydromagnetic waves,** p. 397–401
Bateman, R.; Finney, J. W.; Smith, E. K.; Tveten, L. H. and Watts, J. M.: **IGY observa of F-layer scatter in the Far East,** p. 403–405
Hope, E. R.: **Geotectonics of the Arctic Ocean and the great Arctic magnetic anomaly,** p. 407
Kisslinger, Carl: **Observations of the development of Rayleigh-type waves in the vicini small explosions,** p. 429–436
Hunt, J. N.: **On the damping of gravity waves propagated over a permeable surface,** p. 437
LaChapelle, E.: **Annual mass and energy exchange on the Blue Glacier,** p. 443–449
Martinelli, M., Jr.: **Some hydrologic aspects of Alpine snowfields under summer condit** p. 451–455
Glover, R. E.: **The pattern of fresh-water flow in a coastal aquifer,** p. 457–459
Cooper, H. H., Jr.: **A hypothesis concerning the dynamic balance of fresh water and salt w in a coastal aquifer,** p. 461–467
Schleusener, Richard A. and Corey, A. T.: **The role of hysteresis in reducing evaporation soils in contact with a water table,** p. 469–475
Smith, G. W.: **The determination of soil moisture under a permanent grass cover,** p. 477
Happel, John: **[Discussion of] S. Irmay: On the theoretical derivations of Darch and F heimer formulas [and] Reply by Irmay,** p. 485–487
Chow, Ven Te: **[Discussion of] Hsin Kuan Liu: A note on the differential equation of st gradually non-uniform flow in open channels [and] Reply by Liu,** p. 487–488

Vol. 64, No. 5, May 1959

Cahill, Laurence J., Jr.: **Investigation of the equatorial electrojet by rocket magneto** p. 489–503
Venkatesan, D.: **Solar activity and transient decreases in cosmic-ray intensity,** p. 505–52
Wilkening, Marvin H.: **Daily and annual courses of natural atmospheric radioactivity,** p. 52
Warwick, C.: **Green coronal line intensity and geomagnetism,** p. 527–531
Shaw, Jack T. and Garrison, G. R.: **Formation of thermal microstructure in a narrow en ment during flushing,** p. 533–539
Huff, F. A. and Neill, J. C.: **Comparison of several methods for rainfall frequency ana** p. 541–547
Maasland, Marinus: **Water table fluctuations induced by intermittent recharge,** p. 549–55
Jaeger, J. C.: **The analysis of aquifer test data or thermal conductivity measurements use a line source,** p. 561–564
Press, Frank: **Some implications on mantle and crustal structure from G waves and Love w** p. 565–568
Angino, Ernest E.: **Pressure effects on thermoluminescence of limestone relative to ge age,** p. 569–573
Schmalz, Robert F.: **A note on the system Fe_2O_3-H_2O,** p. 575–579
Berg, E.: **Volcanic eruption in Belgian Congo,** p. 580
Duffus, H. J.; Shand, J. A.; Wright, C. S.; Nasmyth, P. W. and Jacobs, J. A.: **Geogra variations in geomagnetic micropulsations,** p. 581–583

American Geophysical Union: **Abstracts of the papers presented at the Pacific Northwest Regional Meeting, Portland, Oregon, Nov. 13–14, 1958,** p. 585–586

rnal of Marine Research, New Haven, Conn., Vol. 16, No. 2, 1958

Gade, Herman G.: **Effects of a nonrigid, impermeable bottom on plane surface waves in shallow water,** p. 61–82

Hamon, B. V.: **The effect of pressure on the electrical conductivity of sea-water,** p. 83–89

Roden, Gunnar I.: **Spectral analysis of a sea-surface temperature and atmospheric pressure record off southern California,** p. 90–95

Tyler, John E.: **Comparison of light distribution above and below water,** p. 96–99

Schooley, Allen H.: **Profiles of wind-created water waves in the capillary-gravity transition region,** p. 100–108

Reid, Robert O.: **Effect of Coriolis force on edge waves, Pt. 1, Investigation of the normal modes,** p. 109–144

Kajiura, Kinjiro: **Effect of Coriolis force on edge waves, Pt. 2, Specific examples of free and forced waves,** p. 145–157

Aron, William: **The use of a large capacity portable pump for plankton sampling, with notes on plankton patchiness,** p. 158–173

rnal of Meteorology, Boston, Vol. 16, No. 2, April 1959

Craig, Richard A. and Hering, Wayne S.: **Stratospheric warming of Jan.–Feb. 1957,** p. 91–107

House, Donald C.: **The mechanics of instability-line formation,** p. 108–120

Ballenzweig, Emanuel M.: **Relation of long-period circulation anomalies to tropical storm formation and motion,** p. 121–139

Longley, Richmond W.: **Eddy sizes as determined by the temperature fluctuations at O'Neill, Nebraska, Aug. and Sept. 1953,** p. 140–143

Johnson, O.: **An examination of the vertical wind profile in the lowest layers of the atmosphere,** p. 144–148

Gleeson, Thomas A.: **Observational probabilities and uncertainty relations for meteorology,** p. 149–154

Merryman, Jerry D. and Clayton, William H.: **A dynamic wind simulator for the frictional boundary layer,** p. 155–166

Magono, Choji and Takahashi, Tsutomu: **The electric charge on condensate and water droplets,** p. 167–172

Fletcher, N. H.: **On ice-crystal production by aerosol particles,** p. 173–180

DeMarrais, Gerard A.: **Wind-speed profiles at Brookhaven National Laboratory,** p. 181–190

Ackerman, Bernice: **The variability of the water contents of tropical cumuli,** p. 191–198

Fultz, Dave: **A note on overstability and the elastoid-inertia oscillations of Kelvin, Solberg, and Bjerknes,** p. 199–208

Fleisher, Aaron: **Some spectra of turbulence in the free atmosphere,** p. 209–211

Dave, J. V. and Sekera, Z.: **Effect of ozone on the total sky and global radiation received on a horizontal surface,** p. 211–212

Levert, C.: **Limits to certainty [and] Reply by Thomas A. Gleeson,** p. 213–216

Angell, J. K.: **Estimating the frictional force at 300 mb by means of transosonde and radiosonde data,** p. 216–217

Papée, Henry M.: **Activated salt surfaces in ice nucleation and growth and the formation of droplets,** p. 217–218

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Bogatyr', L. F.: **Traektorii tsiklonov na territorii Ukrainy,** [Cyclone trajectories in the Ukraine], p. 15–36

Bogatyr', L. F.: **Raspredelenie osadkov na territorii Ukrainy pri prokhozhdenii tsiklonov razlichnykh traektoriĭ,** [Precipitation distribution in the Ukraine during the passage of cyclones with various trajectories], p. 37–49

Bogatyr', L. F.: **Sviaz' anomaliĭ osadkov s izmeneniem povtoriaemosti tsiklonov,** [Correlation of precipitation anomalies with changes in cyclone frequency], p. 50–53

Dzivakovskaia, L. A.: **Frontal'nye volny na iuge Ukrainy,** [Frontal waves in southern Ukrai
Romov, A. I.: **Ob uchete kharaktera vozdushnogo potoka pri analize i prognoze vliianiia go
oblaka i osadki,** [Estimation of the nature of air currents in the analysis and progn
of the influence of mountains on clouds and precipitation], p. 60–66
Volevakha, N. M.: **O prognoze razlichnykh vidov osadkov v kholodnoe polugodie na Ukra
[Prediction of various types of precipitation during the cold season in the Ukraine], p. 67
Muchnik, V. M.: **Nekotorye voprosy prognozirovaniia livneĭ i groz,** [Some problems of sho
and thunderstorm forecasting], p. 72–74
Gavrilenko, N. M.: **Kharakteristika oblachnosti pri snegopadakh na Ukraine,** [Cloud charac
istics during snowfalls in the Ukraine], p. 75–80
Prikhot'ko, G. F. and Prokh, L. Z.: **Fumulusy pod Kievom 17/VIII 1955 g,** [Fumulus (
hazy) clouds near Kiev on Aug. 17, 1955], p. 81–99
Vinokurov, N. E. and Sedykh, A. V.: **Mikrostruktura oblakov i obledenenie samoletov
nabliudeniiam v g. Kieve,** [Cloud microstructure and airplane icing according to obse
tions at Kiev], p. 100–106
Akimov, M. N.: **Struktura tumanov v Odesse,** [Structure of fog at Odessa], p. 107–130
Antonov, P. L.: **Obrazovanie tumanov v raĭone aeroporta Chernovitsy,** [Fog formation in
region of the Chernovtsy Airfield], p. 131–138
Ardel'ianov, A. M.: **Usloviia obrazovaniia tumanov v raĭone Simferopol'skogo aerop
[Conditions of fog formation in the region of the Simferopol' Airfield], p. 139–146
Ivanova, G. A.: **Obrazovanie tumanov v raĭone aeroporta Dnepropetrovsk,** [Fog formatio
the region of the Dnepropetrovsk Airfield], p. 147–152
Kats, L. I. and Piatnitskiĭ, A. S.: **Nekotorye dannye o tumanakh v raĭone AMSG Kiev,** [S
data on fog in the region of the AMSG (Air Weather Station), Kiev], p. 153–158
Koshelenko, I. V.: **K voprosu o sutochnom khode vlazhnosti,** [Problem of diurnal humi
variations], p. 159–166
Cherviachenko, V. A. and Ponomarenko, I. N.: **Aerosinopticheskie usloviia shtormo
vetrov v iugo-vostochnykh raĭonakh Severnogo Kavkaza,** [Aero-synoptic condition
storm winds in the southeastern regions of northern Caucasus], p. 167–182
Zemliakov, V. M.: **Atmosfernoe davlenie i veter nad Chernym morem,** [Atmospheric pre
and wind over the Black Sea], p. 183–195
Vitvitskaia, Z. M.: **Sinopticheskie usloviia vesennikh zamorozkov na Ukraine,** [Syn
conditions of spring frosts in the Ukraine], p. 196–214

No. 12, 1958 (Voprosy Regional'noĭ sinoptiki [Problems of regional synoptics])

Prikhot'ko, G. F.: **Sviaz' nizkoĭ oblachnosti s meteorologicheskimi iavleniiami,** [Correl
of low cloudiness with meteorological phenomena], p. 3–15
Prikhot'ko, G. F.: **Sviaz' nizkoĭ oblachnosti s sinopticheskimi protsessami na Ukraine,** [Co
tion of low cloudiness with synoptic processes in the Ukraine], p. 16–20
Gavrilenko, N. M.: **Nekotory osobennosti prognoza vidimosti pri nizovykh meteliakh
Ukraine,** [Some peculiarities of visibility prediction during drifting snow in the Ukra
p. 21–30
Gavrilenko, N. M.: **Vidimost' pri snegopadakh i osobennosti ee prognoza,** [Visibility d
snowfall and peculiarities of its prediction], p. 31–56
Antonov, P. D. and Trunova, N. N.: **Meteorologicheskaia i sinopticheskaia kharakteri
groz i ikh prognozirovanie v raĭone Chernovits,** [Meteorological and synoptic char
istics of thunderstorms and their forecasting in the region of Chernovtsy], p. 57–68
Baranova, N. E.: **Pozdnie vesennie zamorozki v Krymu,** [Late spring frosts in Cri
p. 69–80
Volevakha, N. M. and Volevakha, V. A.: **O vozmozhnosti prognoza nachala intensiv
gololedoobrazovaniĭ,** [Possibility of predicting the beginning of intensive glaze forma
p. 81–87
Ponomarenko, I. N.: **K ispol'zovaniiu poleĭ temperatury na urovniakh poverkhnosteĭ 700
mb dlia prognoza peremeshcheniia tsiklonov i antitsiklonov,** [Use of temperature
at 700 and 500 mb levels for the prognosis of cyclone and anticyclone displacements],
99
Ponomarenko, I. N.: **Bariko-tsirkuliatsionnyĭ rezkim iuga Evropeĭskoĭ territorii SSSR i
torye osobennosti pogodnykh uslovii sezonov,** [Pressure-circulation conditions in Sou
European U.S.S.R. and some peculiarities of seasonal weather conditions], p. 100–10
Burtsev, D. A. and Strizhkova, E. M.: **Nekotorye kharakteristiki i sinopticheskie u
formirovaniia i skhoda snezhnogo pokrova v gorakh Kryma,** [Some characteristics a
synoptic conditions of snow cover formation and dissolution in the mountains of Cri
p. 110–122

Cherniakova, A. P.: **Severo-vostochnye shtormy na Chernom i Azovskom moriakh pri peremeshchenii tsiklonov s Maloĭ Azii na iugo-vostok Chernogo moria,** [Northwestern storms in the Black and Azov seas during the passage of cyclones from Asia Minor to the southeast of the Black Sea], p. 123–132

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Zavarina, M. V.: **Opyt operativnogo ispol'zovaniia metoda prognoza zamorozkov po sinoptícheskim dannym,** [Experiment of the operational use of the method of forecasting frost with synoptic data], p. 13–25

Gandin, L. S.: **Ob osobennostiakh isparenііa vblizi beregovoĭ linii,** [Features of evaporation near the shore line], p. 26–35

Rozhdestvenskiĭ, A. A.: **Issledovanie sinopticheskikh protsessov, sviazannykh s osushchestvleniem karskikh vozdeĭstviĭ na osnove izucheniia indeksov tsirkuliatsii,** [Investigation of synoptic processes, related to the results of the Kara Sea influence, based on studies of circulation indices], p. 36–50

Zavarina, M. V.: **Izmeneniia temperatury i vlazhnosti vozdukha pri transformatsii ego malopodvizhnykh antitsiklonakh nad Evropeĭskoĭ territoreĭ SSSR,** [Changes of the temperature and humidity of the air with its modification in the slow moving anticyclones over European U.S.S.R.], p. 51–58

Reshetnikova, K. A.: **K voprosu o koeffitsiente gorizontal'nogo obmena,** [Problem of horizontal exchange], p. 59–63

Gandin, L. S.: **O raschate teplootdachi zdaniĭ v razlichnykh klimaticheskikh usloviiakh,** [Estimate of the heat radiation by building in various climatic conditions], p. 64–73

No. 76, 1958 (Voprosy dinamicheskoĭ meteorologii i teorii klimata [Problems of dynamic meteorology and climatic theory])

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Dubov, A. S. and Stoliarova, G. V.: **Opyt prognoza temperatur gidrodinamicheskimi metodami,** [An attempt at forecasting temperature by hydrodynamic methods], p. 30–39

Dubov, A. S.: **O vliianii gornykh khrebtov na peremeshchenie tsiklonov,** [Influence of mountain ridges on the movement of cyclones], p. 40–49

Kachurin, L. G.: **O sviazi mezhdu vertikalnymi dvizheniiami v atmosfere i intensivnost'iu osadkov iz frontal'nykh oblakov sloistykh form,** [Relationship between vertical movements in the atmosphere and the intensity of precipitation from frontal stratiform clouds], p. 50–60

Gandin, L. S.: **Ob obrazovanii turbulentnykh dvizheniĭ na frontakh,** [Formations of turbulent motion in fronts], p. 61–81

Rakipova, L. R.: **O sviazi mezhdu teplovymi potokami i anomaliiami temperatury atmosfery,** [Relationship between heat currents and air temperature anomalies], p. 82–97

Zubenok, L. I.; Efimova, N. A. and Mukhenberg, V. V.: **Materialy k klimatologicheskomu raĭonirovaniiu SSR,** [Data for the division of the U.S.S.R. into climatologic regions], p. 98–112

Rozhdestvenskiĭ, A. A.: **Opyt statisticheskogo obobshcheniia metoda faz Mul'tanovskogo na osnove indeksov tsirkuliatsii,** [Experiment on statistical generalization of Mul'tanovskiĭ's phase method based on circulation indexes], p. 113–119

Arrago, L. R.: **O metode resheniia uravneniia diffuzii v atmosfere,** [A method of solving atmospheric diffusion equations], p. 120–126

No. 86, 1958

Trifonova, T. S.: **K voprosu ob izmenchivosti plotnosti snezhnogo pokrova,** [The problem of snow cover density fluctuations], p. 3–9

Berlin, I. A.: **K voprosu ob issledovanii sutochnogo khoda otnostel'noĭ vlazhnosti vozdukha,** [The problem of investigating the diurnal variations of relative air humidity], p. 10–16

Kaulini, N. Ia. and Chizhevskaia, M. P.: **Pogreshnost' izmereniĭ temperatury poverkhnosti pochvy rtutnymi pochvennymi termometrami,** [Errors in the measurement of soil surface temperature with mercury soil thermometer], p. 17–21

Vorob'ev, I. E.: **Sravnenie vizual'noĭ otsenki kolichestva oblachnosti s otsenkoĭ, proizvodimo pomoshch'iu setki,** [Comparison of cloud amount by visual estimates and by estima made with the aid of a grid], p. 22–24

Pivovarova, Z. I. and Guliaev, B. I.: **Aktinometricheskie nabliudeniia v lesu,** [Actinomet observations in forests], p. 25–37

Pokrovskaia, I. A.: **O zavisimosti ot temperatury perevodnykh mnozhiteleĭ termoelektricheskĭ aktinometrov i piranometrov,** [Dependence of thermoelectric actinometer and pyranome reduction factors on temperature], p. 38–41

Dubrovin, L. V.: **Kolichestvennyĭ metod kriticheskogo kontrolia gradientnykh nabliudeniĭ skorost'iu vetra v prizemnom sloe (ot 0 do 2 m),** [Quantitative method of critical checki of gradient wind velocity observations near the ground (0–2 m)], p. 42–48

Fateev, N. P.: **K razvitiiu elektricheskikh i radiatsionnykh metodov izmereniia temperatu poverkhnosti pochvy,** [Development of electrical and radiational methods of measuri soil surface temperature], p. 49–56

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Romanov, V. V.: **Raschet ispareniia po uproshchennomu metodu teplovogo balansa,** [Calcu tion of evaporation by a simplified heat-balance method], p. 75–79

Struzer, L. R.: **K voprosu o tochnosti opredeleniia ispareniia metodom teplovogo balan** [Accuracy of the determination of evaporation by the heat-balance method], p. 80–91

Popov, O. V.: **O prosachivanii dozhdevoĭ vody v pochvo-grunty i metodike ego izuchen** [Infiltration of rainwater into the ground and methods of its investigation], p. 92–118

Filippova, A. K.: **Vodopronitsaemost' merzloĭ lesnoĭ podstilki,** [Water permeability of a fro forest floor], p. 119–125

No. 64, 1957

Burtsev, P. N.: **Vybor ratsional'nogo chisla lopasteĭ i ploshchadi proektsii vinta dlia kompone vertushki,** [Selection of a rational number of blades and area of exposed surface of propeller for a component rotor meter], p. 3–10

Dimaksian, A. M.: **Primenenie iadernykh izlucheniĭ v gidrologicheskikh issledovaniia** [Application of nuclear radiation in hydrological investigations], p. 11–19

Zav'ialov, K. D.: **Distantsionnyĭ ukazatel' urovnia,** [Remote water level recorder], p. 20–2

Burtsev, P. N.: **Gidrometricheskaia vertushka s kompensatsieĭ treniia,** [Hydrometrical ro with friction compensation], p. 36–40

Baĭer, B. Iu.: **Issledovanie voprosa o srokakh raboty vertushek mezhdu tarirovkami,** [Resea on the problem of the period of operation of a water meter between calibrations], p. 41-

Zav'ialov, K. D.: **Ukazatel' urovnia vody (U-52),** [Water level indicator (U-52)], p. 46–49

Rimmar, G. M.: **Obobshchenie resul'tatov issledovaniia ekspluatiruemykh gidrometricheskĭ vertushek tipa Zh-3 po metodu vybega,** [Generalization of results of investigations on operation of type Zh-3 flow meters by means of the relaxation method], p. 50–58

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Nepomniashchiĭ, S. I., **Samoletnyĭ sbrasyvaemyĭ radiozond,** [A radiosonde which is drop from an airplane], p. 17–40

Shteĭn, N. I., **Izmenenie chastoty kolebaniĭ i moshchnosti radioperedaiushchikh ustroĭstv izmenenii temperatury okruzhaiushcheĭ sredy,** [Variations in the frequency and stren of radio transmitters with variations in temperature of the surrounding medium], p. 41–

Danilin, A. I., **Omicheskiĭ metod izmereniia vlazhnosti pochvy s primeneniem ugol'n elektrodov v steklovolokne,** [Omic method of measuring soil moisture by means of electrodes in glass wool], p. 52–78

Varzhenevskiĭ, N. S., **Plenochnye datchiki vlazhnosti,** [Pellicular moisture recorders], p. 79

Surazhskiĭ, D. Ia., **Anemograf M-27,** [Amenograph M-27], p. 98–106

Shteĭn, N. I., **Raschet peredatchikov sverkhvysokikh chastot, ispol'zuemykh v radiozonda** [Calculation of ultra high-frequency transmitters used in radiosondes], p. 107–120

Manuĭlov, K. N., **Ispol'zovanie uprugikh zven'ev v mekhanizme barotermogigrometra BM** [Use of elastic links in the mechanism of the BM-1 barohygrometer], p. 121–129

Rinenberg, E. I., Shenderovich, I. M. and Plakhotnik, A. F., **K voprosu ob usovershenstvovanii batitermografa,** [The problem of improving the bathythermograph], p. 130–137
Shteĭn, N. I., **Sootnoshenie mezhdu dlitel'nost'iu radioimpul'sa i dlitel'nost'iu moduliruiushchego impul'sa v lampovykh avtogeneratorakh,** [Interrelation between the duration of a radio impulse and that of a modulating impulse in oscillator tubes], p. 138–144
Surazhskiĭ, D. Ia., **Elektrotermometr uzla kushcheniia,** [Electrothermometer for root clumps], p. 145–148
Surazhskiĭ, D. Ia., **Anemorumbometr na sel'sinakh,** [Sel'syn anemograph], p. 149–155

No. 6, 1958

Usol'tsev, V. A.: **Avtomaticheskiĭ gigrometr tochki rosy,** [Automatic dew point hygrometer], p. 3–38
Nepomniashchiĭ, S. I.: **Samoletnaia distantsionnaia meteorologicheskaia stantsiia,** [Airplane reconnaissance meteorological station], p. 39–65
Varzhenevskiĭ, N. S.: **Plenochnyĭ gigrometr,** [Skin hygrometer], p. 66–72
Danilin, A. I.: **Radioaktivnyĭ snegomer dlia marshrutnykh snegos"emok,** [Radioactive snow gage for route snow surveys], p. 73–88
Manuĭlov, K. H. N. and Shestopalov, L. A.: **Pochvennyĭ bimetallicheskiĭ termometr,** [Bimetallic soil thermometer], p. 89–92
Shenderovich, I. M.: **Mareograf otkrytogo moria,** [Depth gage for open sea], p. 93–110
Nepomniashchiĭ, S. I.: **Elektrodvigatel' dlia radiozondov,** [Electric motor for radio sounding apparatus], p. 111–117
Shteĭn, N. I.: **Usloviia maksimal'noĭ otdachi moshchnosti elektronnymi lampami SVCH, primeniaemymi v radiozondakh,** [Conditions of maximum efficiency of vacuum tubes SVCH used in radiosondes], p. 118–120
Shteĭn, N. I. and Kozhinskaia, B. S.: **Eksperimental'noe issledovanie rezhima avtomoduliatsii lampovogo avtogeneratora,** [Experimental investigation of the conditions for self-modulation of an oscillator tube], p. 121–128
Shteĭn, N. I.: **Raschet elementov sviazi v ul'trakorotkovolnovykh peredatchikakh s dvukhprovodnymi liniiami,** [Design of circuit elements for ultrashort transmitters with two-wire lines], p. 129–136

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Turner, H. S.: **The geographical distribution of clear-air turbulence,** p. 33–38
Hamilton, R. A.: **The temperature gradient in the air above an ice sheet,** p. 38–43
Casswell, S. A.: **A device for relating descriptive terms to air temperatures,** p. 43–45
Krill, A. D.: **Diurnal variation of stratus cloud at Pembroke Dock,** p. 45–47
Beynon, A.: **Waterspout at Nassau, Bahamas, April 12, 1957,** p. 47–49
Meteorological Office discussion on clear-air turbulence, p. 50–54
Bull, G. A.: **Pakistan Meteorological Service,** p. 57–58

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Starr, V. P.: **What constitutes our new outlook on the general circulation?,** p. 167–173
Yoshino, M.: **Wind speed profiles of the lowest air layer under influences of microtopography,** p. 174–186
Sekigawa, T. and Sato, T.: **Anomalous polarization of the light scattered from the atmosphere observed in 1955–1957,** p. 187–192
Kobayashi, T.: **On the habit of snow crystals artificially produced at low pressures,** p. 193–208

Vol. 36, No. 6, Dec. 1958

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Oi, M.: **Preliminary report of a rotating dishpan experiment with no temperature gradient,** p. 217–226
Ohsawa, K.: **Instability line with thunderstorm,** p. 227–238
Murakami, T.: **The sudden change of Upper Westerlies near the Tibetan Plateau at the beginning of summer season,** p. 239–247

Météorologie, Paris, Ser. 4, No. 51, July/Sept. 1958

Robuchon, A. and Ervet, P.: **La mesure du vent en altitude à l'aide d'un radar,** [Measuring upper air wind by means of a radar], p. 153–159

Israël, H.: **Recherches récentes en électricité atmosphérique: mesures pendant l'Année physique Internationale,** [Recent researches on atmospheric electricity: Measurem during the IGY], p, 161–190

Duvergé, Pierre: **Quelques méthodes récentes de prévision des orages,** [Some recent met for forecasting thunderstorms], p. 191–207

Ervet, P.: **Utilisation de la distance oblique dans les sondages vent au radar,** [Use of obl distance in wind soundings by radar], p. 209–222

Gavens, H.: **Système mécanique d'utilisation des trois données du radar,** [Mechanical sys for utilizing three radar-parameter data], p. 223–225

Maignan, (Père): [**Excerpt from his writings to Fermat, Ms. No. 572, folios 167–168**], **appended comment by E. Vassy,** p. 226–228

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Zubian, G. D.: **O mezhshirotnom obmene teplykh i kholodnykh mass vozdukha v stratos zimoĭ,** [The interlatitudinal exchange of warm and cold air masses in the stratosphe winter], p. 3–12

Belinskiĭ, N. A. and Glagoleva, M. G.: **Issledovanie vozmozhnosti ekstrapoliatsii poleĭ anon tsiklo- i antitsiklonicheskoĭ deiatel'nosti,** [Study of the possibility of extrapolating anomaly fields of cyclonic and anticyclonic activity], p. 13–20

Dobryshman, E. M.: **Opredelenie minimal'noĭ temperatury v Antarktike,** [Determinatio the minimum temperature in Antarctica], p. 21–25

Kliukin, N. K.: **O raspredelenii meteorologicheskikh elementov na khrebte Suntar-Kha** [Distriution of meteorological elements on the Suntar-Khayat range], p. 26–30

Du, Sin-iuan': **Reshenie prostranstvennoĭ zadachi izmeneniia geopotentsiala vo vreme utochnennoĭ zamenoĭ laplasiana konechnymi raznostiami,** [Solution of the spatial prol of the change in geopotential with time, in which the substitution of finite difference the Laplacian is made more accurate], p. 31–33

Chirakadze, G. I.: **Skhema gololednogo raĭonirovaniia Zakavkaz'ia,** [A regional classifica of glaze in the Transcaucasus], p. 34–37

Chebotarev, N. P.: **O podzemnom stoke i variatsii godovogo stoka,** [Underground runoff the variation in the annual runoff], p. 37–40

Sapozhnikov, V. I. and Grechko, E. S.: **Prognoz pritoka v vodokhranilishche Volzhskoĭ GES V. I. Lenina po sootvetstvennym raskhodam i promezhutochnomu pritoku,** [Foreca the intake of the reservoir of the V. I. Lenin Volga Hydroelectric Station by the corresp ing discharges and intermediate gains], p. 40–44

Berenbeĭm, D. Ia.: **Mnogoletnie kolebaniia urovnia Chernogo moria i rechnoĭ stok,** [The period variations in the level of the Black Sea and river discharge], p. 44–46

Vlasova, S. V. and Terterov, A. A.: **Opyt gidrometeorologicheskogo izucheniia selenos basseĭnov,** [A hydrometeorological study of flash-flood basins], p. 47–49

Leonov, V. S.; Bulichev, V. N.; Groshev, P. M. and Khakhalin, V. S.: **Vosstanovlenie d khranivshikhsia sukhikh batareĭ pitaniia radiozondov,** [The recharging of dry-cell ra sonde batteries which have been stored for long periods of time], p. 49–50

Nepomniashchiĭ, S. I.: **Novyĭ samoletnyĭ meteorograf dlia vertikal'nogo zondirovaniia atmos** [A new air-borne meteorograph for vertical sounding of the atmosphere], p. 51–53

Zimont, I. L.: **Dozhdeval'no-stokovaia ustanovka,** [A rainfall-runoff simulating appara p. 54–57

Kudritskiĭ, D. M.: **O nivelirovanii morskikh vodomernykh postov,** [The leveling (surveyin marine hydrographic stations], p. 58–60

Krasovskiĭ, A. A.: **K voprosu ob uchete zimnikh osadkov,** [The question of computing w precipitation], p. 60–61

[**Literature on meteorology, hydrology and oceanography for 1958**], p. 61–65

Pshenichnyĭ, A. Ia. and Romanov, N. N.: **Lev Aleksandrovich Molchanov: k 80-letiiu so rozhdeniia,** [Lev Aleksandrovich Molchanov—on his 80th birthday], p. 66–67

Iudin, M. I.: **Mezhdunarodnyĭ simpozium po atmosfernoĭ diffuzii i zagriazneniiu vozdu** [International symposium on atmospheric diffusion and the contamination of air], p. 6

Rubinshteĭn, E. S.: **Pis'mo v redaktsiiu,** [Letter to the editor], p. 69–70

Monthly Weather Review, Wash., D. C., Vol. 87, No. 1, Jan. 1959

Price, Saul and Pales, Jack C.: **The Mauna Loa High Altitude Observatory,** p. 1–14

Mateer, C. L. and Godson, W. L.: **A nomogram for the determination of solar altitude azimuth,** p. 15–18

Kangieser, Paul C.: **Forecasting minimum temperatures on clear winter nights in an arid re a comparison of several climatological aids,** p. 19–28

Macris, George Jac: **Solar energy and sunshine hours at Athens, Greece,** p. 29–32
Stark, L. P.: **The weather and circulation of January 1959: a month of exceptional persistence from the preceding December,** p. 33–39
Dickson, Robert R.: **Tornadoes of January 21, 1959: a feature of a weather singularity?,** p. 40–42

Vol. 87, No. 2, Feb. 1959

Vanderman, Lloyd W.; Drewes, William J. and Hopp, Leo E.: **Comparison of barotropic and baroclinic numerical forecasts and contributions of various effects,** p. 43
Bristor, C. L.: **Zonal wind errors in the barotropic model,** p. 57
Vonnegut, Bernard: **Luminosity accompanying St. Louis tornado—Feb. 10, 1959,** p. 64
Williams, Dansy T.: **A theoretical estimate of draft velocities in a severe thunderstorm,** p. 65
Colón, José A.: **Meteorological conditions over Puerto Rico during hurricane Betsy, 1956,** p. 69

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Majewski, Aleksander: **O wymianie wód miedzy Morzem Bałtyckim a Zalewem Szczecińskim,** [Exchange of water between the Baltic Sea and Szczecin Gulf], p. 13–22

Vol. 6, No. 2, 1958

Born, Artur: **Wleczemie materiału dennego w korytach rzek i potoków,** [Transport of bottom deposits in beds of rivers and streams], p. 25–51
Punzet, Kerzy: **Z zagadnién hydrologii górnej Odry cz. I i II,** [Problems of Upper Oder hydrology], p. 53–86
Synowiec, Adam: **O odpływie z Jeziora Nidzkiego. Przyczynek do hydrologii Wielkich Jezior Mazurskich,** [The outflow from Nida Lake: contribution to the hydrology of the Great Lakes of Masuria], p. 87–89

Vol. 6, No. 3, 1958

Bartnicki, Leonard and Wierzbicki, Zenon: **Zarys klimatyczny Kotliny Sądeckiej i Krynicy,** [Climatic outline of the Sądecka Valley and Krynica], p. 93–116
Lityńska, Z.; Lityński, J.; Morozowska, I.; Osuchowska, B. and Wodzińska, M.: **Typy cyrkulacji atmosferycznej w Europie i ich zastosowanie przy opracowywaniu prognoz 5-dniowych dla Polski,** [Types of atmospheric circulation in Europe and their application in the preparation of five-day forecasts for Poland], p. 117–132

olar Record, Cambridge, Vol. 8, No. 56, May 1957

Downs, Brian W.: **The new constitution of the Scott Polar Research Institute,** p. 412–418
Armstrong, Terence: **Insurance against ice risks,** p. 421–428
Norwegian Arctic weather stations in 1956, p. 451–452

Vol. 8, No. 57, Sept. 1957

Law, P. G.: **Australian National Antarctic Research Expedition, 1956/1957,** p. 533–534
Rikhter, G. D.: **Snow retention for agricultural purposes,** p. 556–557

Vol. 8, No. 58, Jan. 1958

Swedish-Finnish-Swiss International Geophysical Year expedition to Nordaustlandet, 1957–58: operations in 1957, p. 24–25
International glaciological expedition to Greenland, 1957–60: operations in 1957, p. 25–26
Research on anti-icing precautions for ships, p. 36–39
Rastitel'nost' Kraynego Severa SSSR i yeye Osvoyeniye, [Vegetation of the Far North of the U.S.S.R. and its utilization. Collection of papers resulting from a 1955 Conference on Tree growth in the Arctic. Paper No. 1, pub. 1956 (100 p.) was **Okhrana lesov na ikh severnom predele i zashchitnoye lesorazvedeniye v tundre,** [Preservation of forests at their northern limit and protective afforestation in the tundra]. Review of Paper, p. 41–42

Vol. 9, No. 61, Jan. 1959

Freeman, T. N.: **The Canadian northern insect survey, 1947–1957,** p. 299–307

Problemy Arktiki, Leningrad, No. 2, 1957

Frolov, V. V.: **Issledovaniia Sovetskoĭ Arktiki na sovremennom etape,** [Present status Soviet Arctic research], p. 5–17

Laktionov, A. F. and Shamont'ev, V. A.: **Primenenie aviatsii v okeaograficheskikh issled vaniiakh v Arktike,** [Use of aircraft in oceanographic investigations in the Arctic], p. 19–

Stepanov, V. N.: **Kompleksnaia tipizatsiia gidrologicheskogo rezhima moria,** [Complex clas fication of the hydrological regime of the sea], p. 33–40

Timofeev, V. T.: **Atlanticheskie vody v Arkticheskom basseĭne,** [Atlantic waters in the Arct Basin], p. 41–51

Kirillov, A. A.: **Uchet torosistosti pri opredelenii ob"ema l'da,** [Consideration of hummocki in determining ice volume], p. 53–58

Nikiforov, E. G.: **Ob izmenenii splochennosti ledianogo pokrova v sviazi s ego dinamik** [Change in the concentration of the ice cover in connection with its dynamics], p. 59–7

Legen'kov, A. P.: **Dvizhenie dlinnoĭ volny v beskonechnom ploskom kanale peremennoĭ glubin** [Motion of a long wave in an infinite, plane canal of variable depth], p. 73–84

Shesterikov, N. P.: **Predvaritel'nyĭ analiz dreĭfa radiovekh v arkticheskikh moriakh,** [Pr liminary analysis of the drift of radiobeacons in the Arctic Seas], p. 85–91

Baskakov, G. A. and Kudriavtsev, N. F.: **Dolgovremennye avtonomnye stantsii nabliude nad techeniiami v otkrytom more,** [Long-service automatic stations for observation currents in the open sea], p. 93–96

Antonov, V. S.: **Klimaticheskoe raĭonirovanie vodosbornogo basseĭna arkticheskikh mor** [Climatic regioning of the drainage basin of the Arctic Seas], p. 97–105

Borisenkov, E. P.: **Preobrazovanie energii v atmosfere v sviazi s protsessami tsiklogenez** [Transformation of atmospheric energy, in connection with processes of cyclogenesis p. 107–120

Volkonskiĭ, Iu. N.: **Opyt ispol'zovaniia empiricheskikh funktsiĭ vliianiia dlia prognoza polozheni tropopauzy,** [Experiment in the use of empirical influence functions for forecasting t height of the tropopause], p. 121–125

Zavarina, M. V. and Romasheva, M. K.: **Moshchnost' oblakov nad arkticheskimi moriam Tsental'noĭ Arktikoĭ,** [Cloud thickness above Arctic Seas and the Central Arctic], p. 12 132

Voskresenskiĭ, A. I.; Morachevskiĭ, V. G. and Nikandrov, V. Ia.: **Primenenie tverdoĭ uglekislo dlia rasseivaniia oblakov v Arktike,** [Use of dry ice for cloud dispersal in the Arctic p. 133–139

Kuperov, L. P.: **O metodike kratkosrochnogo radioprognozirovaniia,** [The method of sho range radio forecasting], p. 141–147

Zaborshchikov, F. Ia. and Fediakina, N. I.: **O sviazi mezhdu poliarnymi siianiiami, raspr straneniem radiovoln, magnitnymi i ionosfernymi vozmushcheniiami,** [The correlation polar auroras, radiowave propagation, and magnetic and ionospheric disturbances], p. 14 159

Peschanskiĭ, I. S.: **O nekotorykh problemakh arkticheskogo ledovedeniia,** [Some problems Arctic glaciology], p. 161–170

Iakovlev, G. N.: **Turbulentnyĭ teploobmen ledianogo pokrova s vozdukhom v Tsentral'n Arktike,** [Turbulent heat exchange between the ice cover and the air in the Central Arctic p. 193–204

Przegląd Geofizyczny, Warsaw, Vol. 3 (i.e., 11), No. 3/4, 1958

Parczewski, Władysław: **Natężenié opadu burzowego a częstotliwość wyładowań elektrycznyc** [Intensity of thunderstorm precipitation and the frequency of electric discharges], p. 20 227

Wierczek, Elżbieta: **Częstotliwość występowania poszczególnych kierunków wiatrów dolny W Karpatach zachodnich (Na obszarze województwa Krakowskiego,** [Direction frequen of low winds in the western Carpathians in Krakow Province], p. 229–234

Jasiński, Stefan: **Zagadnienie i znaczenie radiometeorologii i radioklimatologii,** [Tasks a significance of radiometeorology and radio climatology], p. 235–248

Buinitskii, Viktor Kh.: **O niektórych wynikach nainowszych badań oceanograficznych Basenie Arktycznym,** [Some results of most recent oceanographic studies in the Arct basin], p. 249–274

Mitosek, Henryk: **Próba zorganizowania obserwacji rolniczo-meteorologicznych na terytorium B. Królestwa polskiego w końcu XIX wieku,** [Attempts at organizing agricultural meteorological observations in the former Kingdom of Poland at the end of the 17th century], p. 275–280

Wirkus, Feliks: **O graficznych metodach prognozy pól wysokości powierzchni izobarycznych** [Graphic methods of predicting the heights of isobaric surface fields], p. 281–302

Zych, Stanisław: **Rozwój doświadczeń nad energią jądrową a oceanografia,** [Development of knowledge on nuclear energy and oceanography], p. 303

Xien, Nguyen: **Charakterystyka przebiegu pogody w Wietnamie w 1957 roku,** [Weather characteristics in Vietnam in 1957], p. 304–306

Manczarski, S.: **Polsko-Czechosłowacka Konferencja poświęcona klimatowi Tatr,** [Polish-Czechoslovak Conference on the Climate of the Tatra Mountains], p. 306–308

Manczarski, S.: **Udział Polski w V Międzynarodowej Konferencji Komitetu Specjalnego MGR (CSAGI),** [Participation of Poland in the 5th International Conference of the Special Committee of the IGY], p. 308–310

Lambor, J.: **O tematyce hydrologicznej najbliższego Ogólnego Zebrania Międzynarodowej Unii Geodezyjno-Geofizycznej w Helsinkach w 1960 roku,** (Hydrological subjects of the next General Conference of the International Geodetic-Geophysical Union in Helsinki in 1960), p. 310–311.

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Obukhov, A. M. and Iaglom, A. M.: **On the microstructure of atmospheric turbulence: a review of recent work in the U.S.S.R.,** p. 81–90

Israël, H.: **Atmospheric electrical agitation,** p. 91–104

Douglas, R. H. and Hitschfeld, W.: **Patterns of hailstorms in Alberta,** p. 105–119

James, D. G.: **Observations from aircraft of temperatures and humidities near stratocumulus clouds,** p. 120–130

Scorer, R. S. and Klieforth, H.: **Theory of mountain waves of large amplitude,** p. 131–143

Woodward, Betsy: **The motion in and around isolated thermals,** p. 144–151

Green, F. H. W.: **Some observations of potential evaporation, 1955–1957,** p. 152–158

Vines, R. G.: **Wind stress on a water surface: measurements at low wind speeds with the aid of surface films,** p. 159–162

Oddie, B. C. V.: **The composition of precipitation at Lerwick, Shetland,** p. 163–165

Hamilton, R. A.: **The pressure gradient at the edge of an ice sheet,** p. 166–167

Hamilton, R. A.: **The diurnal variation of pressure on the Greenland ice sheet,** p. 168–170

Ludlam, F. H.; Scorer, R. S. et al.: [**Discussion of**] **R. C. Rainey: Some observations on flying locusts and atmospheric turbulence in Eastern Africa,** p. 171–173

Penman, H. L.; Taylor, L. R. et al.: [**Discussion of**] **C. G. Johnson: The vertical distribution of aphids in the air and the temperature lapse rate,** p. 173–176

Fleagle, R. G.; Jefferson, G. J.; Manley, G. et al.: [**Discussion of**] **R. A. Hamilton: The meteorology of North Greenland during the midsummer period** [**and his**] **The meteorology of North Greenland during the midwinter period,** [**and**] **Reply by Hamilton,** p. 176–178

sesoiuznoe Geograficheskoe Obshchestvo, Leningrad, Izvestiia, Vol. 90, No. 1, Jan./Feb. 1958

Gershman, A. E.: **Reka Khuankhe i pervoocherednye meropriiatiia po uporiadocheniiu ee rezhima,** [The Hwang Ho and the most important measures for regulating its regime], p. 3–13

Beletskiĭ, E. A.: **V gorakh Zapadnogo Kitaia,** [In the mountains of Western China], p. 14–24

Rukhin, L. B.: **Problema proiskhozhdeniia materikovykh oledeneniĭ,** [The problem of the origin of continental glaciations], p. 25–38

Maksimov, E. V.: **K voprosu o drevnikh oledeneniiakh v Dzhungarskom Alatau,** [Ancient glaciations of the Dzungarian Alatau], p. 45–48

Gorbatskiĭ, G. V.: **Tak nazyvaemye ledniki Penka na Novoĭ Zemle i nekotorye cherty raĭona ikh rasprostraneniia,** [So-called Penck's glaciers of Novaya Zemlya and certain characteristics of the region], p. 55–58

Kovalev, P. V.: **Lednik Bashil',** [The Bashil glacier], p. 59–62

Melkheev, M. N.: **Ob usloviiakh obrazovaniia i strukturnykh tipakh donnogo l'da na rekakh vostochnoĭ Sibiri,** [Formation and structural types of anchor ice in rivers of eastern Siberia], p. 63–66

Ivanov, N. N.: **Eshche o formule ispariaemosti,** [More on the evaporation formula], p. 75–76

Vol. 90, No. 5, Sept./Oct. 1958

L'vovich, M. I.: **Effektivnost' zapretnykh vodookhrannykh polos lesa vdol' rek i problema il eksploatatsii,** [The effectiveness of shelterbelts along rivers for water conservation p. 424–437

Mel', M. I.: **Pavel Ivanovich Koloskov: 70 let zhizni i 50 let nauchnoĭ deiatel'nosti,** [P. Koloskov, 70th anniversary and 50 years of scientific activity], p. 467–468

Parmuzin, Iu. P.: **O zonal'noĭ prirode poliusa kholoda,** [The zonal nature of the cold pole p. 472–474

L'iakhova, A. G.: **Fenologicheskaia rabota Stalingradskogo otdela Geograficheskogo obshchest SSSR,** [Phenological work of the Stalingrad section of the Geographical Society of t U.S.S.R.], p. 495

Weather, London, Vol. 14, No. 3, March 1959

Mason, B. J.: **Recent developments in the physics of rain and rain-making,** p. 81–97

Gold, Michael J. E.: **Three months of snow, ice and blizzards,** p. 98–100

Wiggett, P. J.: **World climatology: a public service,** p. 101–102

Waterspouts and tornadoes, p. 103–104

Rossmann, Fritz O.: **Some further remarks on waterspouts,** p. 104–106

Royal Meteorological Society meetings, p. 109–112

Vol. 14, No. 4, April 1959

Jackson, Allan A.: **The eco-climatology of Dutch lights, Pt. 1, Meteorological assessmen** p. 117–123

Ho, Ping-Yü and Needham, Joseph: **Ancient Chinese observations of solar haloes and parheli** p. 124–134

Bonacina, L. C. W. and Carter, C. I.: **Summer evening visibility over London in 1958,** p. 135–1

Poulter, R. M.: **Weather 1958 photographic competition prizewinner,** p. 139

Chuter, I. H.: **Snow polygons,** p. 139

Frith, R.: **Thermo-nuclear explosions and the weather,** p. 140–142

Royal Meteorological Society Meetings, p. 142–147

PART IV. AUTHOR AND SUBJECT INDEXES

In this section will be found reference to the number given at the head of each abstract or entry n Part I each entry begins with the number 10.5, and in Part II in the Bibliography on Ozone each ntry begins with the number and letter 10E. This index is divided into three parts:

Index of Authors | Index of Subjects | Index of Geographic Locations

INDEX OF AUTHORS

Abdullah, A. J., 10.5–225
Academia Sinica, Peking. Inst. of Geophysics and Meteorology, 10.5–228
Adams, R. M., 10.5–116
Adel, A., 10E–47
Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz., 10.5–53
Akita, T., 10E–102
Akiyama, T., 10.5–276
Alaka, M. A., 10.5–56
Alaska. Univ. Geophysical Institute, 10E–74, 10E–115
Alfuth, W., 10.5–260
Alkire, H. L., 10.5–143
American Geophysical Union, Transactions, 10.5–44, 10.5–45
American Insurance Association, N. Y., 10.5–312
American Meteorological Society. District of Columbia Branch, 10.5–3
Anapol'skaia, L. E., 10.5–21
Anderson, D. L., 10.5–139
Anderson, W. W., 10.5–103, 10.5–104
Andreev, N. K., 10.5–144
Anglo-russkiĭ okeanograficheskiĭ slovar, 10.5–37
Arabadzhi, V. I., 10.5–331
Arakawa, H., 10.5–29
Arizumi, N., 10.5–247
Arnason, G., 10.5–3
Arnold, A., 10.5–280
Aschenbrand, L. A., 10.5–291
Aschenbrand, L. M., 10.5–206
Ashford, O. M., 10.5–46
Auer, R., 10E–32
Austin, J. M., 10.5–3
Australian and New Zealand Association for the Advancement of Science, 10.5–75

Baker, P. T., 10.5–157
Balabuev, A. G., 10.5–311
Balakov, V. V., 10E–25
Baldacci, Ozvaldo, 10.5–145
Bannon, J. K., 10.5–63
Barbier, D., 10E–22, 10E–36
Barrueto, R. B., 10.5–156
Bartel, A. W., 10E–103
Bass, D. E., 10.5–156
Bean, B. R., 10.5–215
Beesmer, K. M., 10.5–193
Bellucci, R., 10.5–280
Bentley, C. R., 10.5–133
Bergen, C. (*trans.*), 10.5–78, 10.5–79, 10.5–80, 10.5–81
Bergeron, T., 10.5–89
Bezverkhniĭ, Sh. A., 10E–104
Bilancini, R., 10.5–89, 10.5–99
Blifford, I. H., Jr., 10.5–200
Boggess, R. L., 10.5–170
Boguslavskiĭ, S. G., 10.5–250
Bolin, B., 10.5–89
Bolivia. Servicio Meteorológico, 10.5–169
Booth, A. W., 10.5–149
Börnstein, R., 10E–143
Borisova, E. I., 10.5–248
Boudouris, G., 10.5–28
Bouët, M., 10.5–290
Bowen, G. I., 10E–75
Bradfield, F. B., 10.5–90
Breckenridge, J. R., 10.5–329
Brewer, A. W., 10E–41, 10E–131, 10E–140
Brezowsky, H., 10.5–306
Brinkman, M., 10.5–116
Bristow, G. C. (ed.), 10.5–41
Brockamp, B., 10.5–59
Brook, M., 10.5–337
Brückmann, W., 10.5–229
Bryant, G. T., 10.5–153
Buchinskiĭ, I. E., 10.5–22, 10.5–82
Buisson, H., 10E–6
Bulavko, A. G., 10.5–69, 10.5–77
Burgess, E., 10.5–20
Burhans, R. W., 10.5–107
Byers, H. R., 10.5–89

Cabannes, J., 10E–8
Cain, J. C., 10E–74, 10E–101
Cairo. Sci. and Tech. Documentation Centre, 10.5–96
Callendar, G. S., 10.5–201
Campbell, L., Jr., 10.5–113
Canada. Met. Branch, 10.5–48
Carbenay, J., 10E–132
Carnegie Inst. of Washington, 10.5–23
Cauer, H., 10E–76
Chalmers, J. A., 10.5–338
Chalonge, D., 10E–19, 10E–22, 10E–36
Chang, Y., 10.5–190
Chapman, S., 10.5–51, 10E–14, 10E–38, 10E–77, 10E–140
Chappuis, J., 10E–3
Charnock, H., 10.5–281
Chen, Yung-san, 10.5–183
Cherkasskaia, V. M., 10.5–179
Chernoivanenko, I. M., 10.5–313
Chi, C. H., 10.5–155
Chicago. Univ. Dept. of Meteorology, 10.5–191
Chilton, D., 10.5–87
Chiplonkar, M. W., 10E–33
Clark, J. A., 10.5–258
Clem, L. H., 10.5–270
Coates, J. B., Jr., (ed.), 10.5–19
Cobb, W. E., 10.5–334
Coblentz, W. W., 10E–34
Cohen, E., 10.5–103
Collias, E. E., 10.5–105
Collins, C., 10.5–164
Colloque International d'Astrophysique, 7th, Liege, July 12–14, 1956, 10.5–1, 10.5–2
Colorado. Univ. High Altitude Obs., Climax, 10.5–332

Committee on Evaluation of Long-range Weather Forecasting, 10.5–27
Conference on Atmospheric Ozone, Oxford, Sept. 9–11, 1936, 10E–24
Contract AF 19(122)-65, 10E–91
Contract AF 19(122)-90, 10E–62
Contract AF 19(122)-238, 10E–147
Contract AF 19(122)-392, 10E–80, 10E–134
Contract AF 19(122)-461, 10.5–223
Contract AF 19(604)-127, 10E–115
Contract AF 19(604)-545, 10.5–170
Contract AF 19(604)-763, 10E–144, 10E–145
Contract AF 19(604)-1491, 10.5–332
Contract AF 19(604)-1000, 10.5–233
Contract AF 19(604)-1511, 10.5–170
Contract AF 19(604)-1564, 10.5–214
Contract AF 19(604)-1948, 10.5–170
Contract AF 19(604)-2060, 10.5–274
Contract DA 36-039 SC-71145, 10.5–337
Contract Nonr-477(01), 10.5–105
Contract Nonr-477(10), 10.5–105
Contract N8onr-520/III, 10.5–105
Contract Noas-55-262-C, 10.5–191
Cooperative Research Foundation, Golden Gate Park, S. Francisco, 10.5–274
Cornu, A., 10E–2
Corrsin, S., 10.5–120
Court, A., 10.5–274
Courtemanche, A., 10.5–128
Craig, R. A., 10E–53, 10E–78
Cramer, H. E., 10.5–226
Cwilong, B. M., 10E–41
Cyclopedia of weather and climate, 10.5–38

Dao, Shih-yen, 10.5–296
Darlington, C. R., 10.5–20
Dauvillier, A., 10E–21
Davies, D. A., 10.5–55
Davis, J. R., 10.5–283
Decker, F. W., 10E–133
Defant, A., 10.5–8
de Haller, P., 10.5–132
Dell, H. A., 10.5–174
Deming, L. S., 10E–27
Dexter, R. V., 10.5–162
Diamond, P., 10E–126
Di Benedetto, F., 10.5–249
Dobson, G. M. B., 10E–9, 10E–11, 10E–23, 10E–41, 10E–54, 10E–105, 10E–140
Dondes, S., 10E–136
Dorman, H. J., 10.5–133
Dorrance, W. H., 10.5–121
Douglas, G. P., 10.5–90
Droessler, E. G., 10.5–192
Drozdov, O. A. (ed.), 10.5–21
Duckert, P., 10E–10
Dütsch, H. U., 10E–42, 10E–55, 10E–140
Dufay, J., 10E–8
Đurić, D., 10.5–89

Eberlein, A. J., 10.5–171
Eck, B., 10.5–9
Egypt. National Research Council, 10.5–96
Ehmert, A., 10E–79, 10E–106, 10E–107, 10E–140
Eichenberger, W., 10.5–10
Einarsson, E., 10.5–262
Ellsaesser, H. W., 10.5–3
El-Moslimany, M. A., 10.5–170
Elsasser, W. M., 10E–134
Ermini, V., 10.5–244

Fabry, Ch., 10E–6, 10E–13 (ed.), 10E–56
Fay, P. S., 10.5–107
Fergusson, E. S., 10.5–112
Fett, W., 10.5–11
Filler, A. S., 10E–80
Fireman, M., 10.5–284
Ford, W. L., 10.5–102
Fowle, F. E., 10E–12
Fowler, A., 10E–7
Frazier, D., 10.5–107
Fritz, S., 10E–57, 10E–81, 10E–140
Fukuta, N., 10.5–197

Gabilly, A., 10.5–230
Gabites, J. F., 10E–58
Gal'gerov, S. S., 10.5–57
Gal'tsov, A. P., 10.5–277
Gandin, L. S., 10.5–159
Gardner, W. R., 10.5–284
Garrido, J. (ed.), 10.5–96
Gauzit, J., 10E–29
Gehringer, J. W., 10.5–103, 10.5–104
Generalov, A. A., 10.5–158
Georgi, J., 10.5–58
Gerhardt, J. R., 10.5–173
German, R., 10.5–52
Germany. Deutscher Wetterdienst in der US-Zone, 10[illegible] 48
Geyer, J. C., 10.5–153
Glasspoole, J., 10.5–297
Glebova, M. Ia., 10.5–322
Glueckauf, E., 10E–39
Gōda, I., 10.5–234
Godard, L., 10.5–288
Goddard, N. E., 10.5–174
Goedecke, E., 10.5–134
Götz, F. W. P., 10E–11, 10[illegible] 15, 10E–16, 10E–30, 10E–[illegible] 10E–83, 10E–140
Gogishvili, K. S., 10.5–232
Gold, L. W., 10.5–307, 10.[illegible] 308
Golding, E. W., 10.5–154
Gol'tsberg, I. A., 10.5–30
Gorodova, M. I., 10.5–180
Gorskaia, V. I. (*ed.*), 10.5–3[illegible]
Gorskiĭ, N. N. (*ed.*), 10.5–37
Gowan, E. H., 10E–43, 10[illegible] 135, 10E–140
Grant, G., 10.5–107
Grishin, I. S., 10.5–275
Grishin, N. I., 10.5–39
Grundy, F., 10.5–285
Guenther, Wm. B., 10E–101
Gullentops, F., 10.5–131
Gunn, R., 10.5–334
Gutmann, J., 10.5–92

Haalck, H. (*ed.*), 10.5–12
Hall, V. C., Jr., 10E–62
Hamada, Y., 10.5–147
Harbeck, G. E., Jr., 10.5–4
Harradine, F., 10.5–327
Harrison, D. N., 10E–9
Harteck, P., 10E–136
Hartley, W. N., 10E–4
Hartz, T. R., 10.5–256
Haselgrove, J., 10.5–211
Hatakeyama, H., 10.5–333
Haurwitz, B., 10E–31
Havens, J. M., 10.5–86
Heigel, K., 10E–108
Heisler, L. H., 10.5–208
Hering, W. S., 10.5–3
Herman, L., 10.5–176
Herman, R., 10.5–176
Hertzberg, A., 10.5–122
Hess, H. H., 10.5–148
Hinzpeter, H., 10E–109
Hopfield, J. J., 10E–129
Houzeau, A., 10E–1
Howard, J. N., 10E–158
Hueber, F. M., 10.5–128
Huggins, W., 10E–5
Hulburt, E. O., 10E–137
Hynek, J. A., 10.5–113

n, E. C. Y., 10E–138
stitution of Electrical Engineers, 10.5–42
ternational Geophysical Year, 1957/1958. Japanese National Committee for the IGY, 10.5–43
ternational Symposium on Atmospheric Ozone, Univ. of Oxford, Sept. 2–4, 1952, 10E–139
ternational Union of Geodesy and Geophysics. Association of Meteorology, Brussels, 1951, 10E–140
U.G.G. International Ozone Commission, 10E–139
aeva, E. N., 10.5–181, 10.5–182
ikawa, H., 10.5–178
ono, K., 10.5–309
rael. Hydrological Service, 10.5–24
tanbul. Technical University, 10.5–78

acchia, L. G., 10.5–115
ames, J. C., 10.5–330
apan. Hydrographic Office, 10.5–25
enny, H., 10.5–327
essel, U., 10E–110
ohannessen, K. R., 10.5–3
ohnson, F. S., 10E–84, 10E–111, 10E–140, 10E–141
ones, A. L., 10.5–107
ones, J., 10E–74
ones, N., 10.5–126
uhász, J., 10.5–261
ulius, A. L., 10E–96, 10E–140
unge, C., 10E–85
ursa, A. S., 10.5–291

Kalesnik, S. V., 10.5–16
Kalinin, G. P., 10.5–160
Kalitin, N. N., 10.5–205
Kamiyama, K., 10.5–325
Kano, M., 10.5–335
Karandikar, R. V., 10E–49, 10E–67
Karapiperis, L. N., 10.5–301
Kashin, K. I., 10.5–71
Kawano, M., 10.5–221, 10.5–333
Kay, R. H., 10E–140
Kellog, W. W., 10.5–3
Ketchum, B. H., 10.5–102
Khaidarov, A. A., 10.5–254
Khakhalin, V. S., 10.5–40
Khalek, H., 10E–112
Khazova, O. N., 10.5–248
Kheĭfets, Ia. M., 10.5–188
Khraborov, Iu. B., 10.5–72
Kibler, C. L., 10.5–302
Kilday, G. D., 10.5–243
Kilinski, E. v., 10.5–336
King, J. I., 10E–134
King, K. M., 10.5–286
Kira, K., 10E–86
Kiriakov, K. P., 10.5–13
Klein, W. H., 10.5–279
Koberg, G. E., 10.5–4
Kochanski, A. B., 10.5–3
Koffman, L. A., 10.5–314
Kohler, M. A., 10.5–4
Komabayasi, M., 10.5–309
Konaga, S., 10.5–106
Kondrat'ev, K. Ia., 10E–142
Konstantinova-Shlezinger, M., 10E–25
Koo, Chen-chao, 10.5–183
Kopecký, M., 10.5–255
Koppány, G., 10.5–184
Korb, G., 10.5–318
Koyano, M., 10.5–165
Kozan-Beletskiĭ, G. I., 10.5–339
Krasikov, P. N., 10.5–251
Krivich, S. S., 10E–25
Kulik, M. S., 10.5–278
Kulkarni, R. N., 10E–122, 10E–154
Kuls, W., 10.5–320
Kurun, A. (trans.), 10.5–78
Kusakabe, M., 10.5–303
Kuwana, J., 10E–86

Lamb, H. H., 10.5–231
Landolt, H. H., 10E–143
Landsberg, H., 10.5–14
Langer, R. M., 10E–140
Langford, J. C., 10.5–185
Langlo, K., 10E–113
Lauscher, F., 10.5–92, 10.5–93
Lawrence, J., 10E–9
Lawrence, R. B., 10E–62
Lebedev, A. N., 10.5–245
Lebon, J. H. G., 10.5–123
Lejay, P., 10E–28
Lemmens, J., 10.5–108
Leningrad. Glavnaia Geofizicheskaia Observatoriia, 10.5–15
Leppard, R. E., 10E–135
Liapunov, B. V., 10.5–33
Ling, S. H., 10.5–172
Liu, Kwang-ran, 10.5–239
Logan, J. G., Jr., 10.5–122
Lorenz, E. N., 10.5–233
Love, C. M., 10.5–105
Lowe, A. B., 10.5–262
Lowrey, R. D., 10E–101
Lucke, O., 10E–156
Lydolph, P. E., 10.5–305

MacCready, P. B., Jr., 10.5–193
McCumber, N., 10.5–116
McGuire, J. K., 10.5–146
Machta, L., 10.5–3
McIntosh, C. B., 10.5–269
McVean, D. N., 10.5–310
Madagascar. Service Météorologique, 10.5–194
Maeda, K., 10E–59
Mager, M., 10.5–156
Makoveev, M. S., 10.5–34
Maksimov, S. A., 10.5–31
Maksimovich, G. A., 10.5–324
Malovčak, P., 10.5–264
Malurkar, S. L., 10E–60
Maňák, J., 10.5–85
Mano, H., 10.5–259
Manson, N., 10.5–267
Mariani, F., 10.5–207
Marmo, F. F., 10.5–291
Massachusetts Institute of Technology, Dept. of Meteorology, 10.5–233
Mastanbrook, H. J., 10.5–3
Masuda, Y., 10.5–235
Masui, T., 10.5–236
Matreshina, T. D., 10E–142
Mazin, I. P., 10.5–26
Mead, W. J., 10.5–27
Mecke, R., 10E–17
Meeks, M. L., 10.5–330
Meessen, A., 10.5–175
Meetham, A. R., 10E–23
Meinardus, W., 10.5–61
Mellen, G. L., 10E–62
Mendes Corrêa, A. A. E., 10.5–195
Mennella, C., 10.5–293
Mertsslov, A. N., 10.5–186
Meteorological Bulletin, Taipei, Formosa, 10.5–240 to 10.5–242
Meteorologiia i Gidrologiia, 10.5–73
Meteorology Research, Inc., Pasadena, 10.5–196
Michigan. Univ. Engineering Research Institute, 10.5–170
Miliukov, P. I., 10.5–160
Mitchell, J. M., Jr., 10.5–257
Mitra, S. K., 10E–114
Miyake, Y., 10E–61, 10E–87, 10E–140
Möller, F., 10.5–83
Mohler, F. L., 10E–26
Momose, N., 10.5–165
Moorthy, Bh. V. R., 10E–122
Moreland, W. B., 10.5–3
Morgen, A., 10E–88
Moscow. Tsentral'naia Aerologicheskaia Observatoriia, 10.5–26
Mount, W. D., 10.5–3
Mrose, H., 10.5–202
Muchnik, V. M., 10.5–299
Mukherjee, A. K., 10.5–340

Mukherjee, N. R., 10E–115
Munro, G. H., 10.5–208, 10.5–209
Murai, K., 10.5–335
Muranov, A. P., 10.5–66, 10.5–67
Murray, W. D., 10E–144, 10E–145
Musaelian, Sh. A., 10.5–188
Mustel', E. R., 10.5–32

Nagata, T., 10.5–64
Nakamura, S., 10.5–247
Nakano, M., 10.5–100
Nania, A., 10.5–163
National Defense Research Committee, 10.5–27
National Research Corporation, Cambridge, Mass., 10E–62
Neiburger, M., 10.5–203
Neronova, L. M., 10.5–294
Neuberger, H. H., 10.5–78 to 10.5–81
Neuwirth, R., 10E–116, 10E–146
New Mexico Inst. of Mining and Technology. Research and Development Div., Socorro, 10.5–337
New Mexico. University, 10E–63
New York Univ. College of Engineering. Research Div., 10E–144, 10E–145, 10E–147
Nezhikhovskiĭ, R. A., 10.5–16
Nicolet, M., 10.5–199, 10E–40
Nonweiler, T., 10.5–118
Normand, Sir C., 10E–89, 10E–139, 10E–140, 10E–148
Noth, H., 10.5–17

Obenland, E., 10E–90, 10E–149
Oblakov, F. V., 10.5–109
O'Brien, B., 10E–26
Obukhov, A. M., 10.5–161
O'Connell, D. J. K., 10.5–7
O'Connor, J. F., 10.5–265
Odishaw, H., 10.5–52
Ogata, T., 10.5–101
Oguti, T., 10.5–64
Ohio. State Univ. Research Foundation, 10E–91
Oi, M., 10.5–222
Okamoto, M., 10.5–266
Okushko, A. A., 10.5–68
Olczak, T., 10.5–47
Oliver, J. E., 10.5–139
Olkkonen, E., 10.5–142
Ono, A., 10.5–309
Osherovich, A. L., 10E–104
Osipova, G. I., 10.5–289

Paetzold, H. K., 10E–69, 10E–92, 10E–93, 10E–117, 10E–118, 10E–140, 10E–150 to 10E–152
Palosuo, E., 10.5–142
Panofsky, H. A., 10.5–3, 10.5–226
Papagianakis, S. D., 10.5–246
Papp, L., 10.5–127
Paquette, R. G., 10.5–105
Paszyński, J., 10.5–321
Pavlova, E., 10E–25
Pekeris, C. L., 10E–119
Penndorf, R., 10E–44, 10E–45, 10E–50, 10E–64, 10E–65, 10E–94
Petersen, H., 10E–18
Peterson, K. R., 10.5–219
Petr, B., 10.5–326
Petrov, G. D., 10.5–331
Petterssen, S., 10.5–5
Pfotzar, G., 10E–69
Piaskovskaia-Fesenkova, E. V., 10.5–18
Picko, V., 10.5–326
Pikush, N. V., 10.5–315
Pinus, N. Z., 10.5–271
Pisharoty, P. R., 10.5–220
Plashchev, A. V., 10.5–141
Platagea, G., 10.5–316
Poliakova, E. A., 10E–66
Pollard, K., 10.5–187
Pomeroy, P. W., 10.5–133
Popp, G. E., 10E–120
Potzger, J. E., 10.5–128
Press, H., 10.5–272
Pressman, J., 10.5–291
Primault, B., 10.5–328
Pring, J. N., 10E–121
Priroda, Moscow, 10.5–341
Prokof'eva, I. A., 10E–95
Prudhomme, A., 10.5–60
Purcell, J. D., 10E–84, 10E–111, 10E–140

Queiroz, D. X. de., 10.5–150
Quitt, E., 10.5–263

Ramana Murthy, Bh. V., 10E–153
Ramanathan, K. R., 10E–49, 10E–67, 10E–122, 10E–153, 10E–154
Rao, V. R. K., 10.5–226
Reed, R. J., 10E–68, 10E–96, 10E–140, 10E–155
Regener, E., 10E–69, 10E–124, 10E–125, 10E–140
Regener, V. H., 10E–75, 10E–97, 10E–123
Reiter, E. R., 10.5–191
Renaud, A., 10.5–132
Renger, F., 10E–156
Renzetti, N. A., 10.5–203

Reshetnikova, K. A., 10.5–
Réunion de l'Ozone et l'Absorption Atmosphériq Paris, 1929, 10E–13
Richardson, W. H., 10.5–17
Riggs, L. P., 10.5–214, 10 215
Robbins, A., 10.5–211
Robinson, G. D., 10.5–281
Rodionov, S. F., 10E– 10E–104
Roelofs, R., 10.5–50
Rogers, L. H., 10.5–203
Rogers, M. R., 10.5–302
Rohsenow, W. M., 10.5–258
Rojecki, A., 10.5–65, 10.5–8
RosenKranz, F., 10.5–93
Rosescu, E., 10.5–317
Rossby, C. G., 10.5–89
Rossing, A. T., 10.5–3

Sänger, R., 10.5–287
Saga, Japan. Meteorologi Observatory, 10.5–300
Sakai, I., 10E–98
Sakamoto, T., 10.5–166
Sala, I., 10.5–138
Sano, I., 10.5–197
Sartor, J. D., 10.5–189
Saruhashi, K., 10E–61, 10 87, 10E–140
Schilling, G. F., 10.5–111, 10 112, 10.5–114
Schloemer, R. W., 10.5–151
Schneider-Carius, K., 10.5–2
Schulze, W., 10E–70
Schuppert, K., 10.5–130
Schwarzl, S., 10.5–268
Schweizer Aero-Revue, Ber 10.5–124
Scorer, R. S., 10E–157
Seed, T. J., 10.5–342
Séguier, J., 10.5–176
Sekiguti, R., 10E–20
Selleck, G. W., 10.5–130
Serpolay, R., 10.5–198
Shaw, J. H., 10E–158
Shaw, R. R., 10.5–97
Shaw, Sir W. N., 10E–37
Sheppard, P. A., 10.5–89
Sherrod, J., 10.5–98
Shu, Yu-fung, 10.5–183
Shumeĭko, V. P., 10.5–22
Siguier, J., 10.5–176
Skovronskaia, A. E., 10.5–1
Smith, De W., 10.5–152
Smith, R. G., 10E–126
Smith, T. B., 10.5–193
Smithsonian Institution. A trophysical Observato 10.5–49
Solomon, I., 10.5–292
Spencer, N. W., 10.5–170
Spreen, W. C., 10.5–292

Durr, S. H., 10.5–129
Stair, R., 10E–34, 10E–51, 10E–52, 10E–127, 10E–159
Stein, S., 10.5–216
Sterne, T. E., 10.5–111
Stevens, G. C., 10E–57
Stewart, H. S., Jr., 10E–26
Stine, G. H., 10.5–117
Stranz, D., 10E–46
Strutt, R. J., 10E–7
Stupnikov, N., 10E–25
Suomi, V. E., 10.5–223
Suzuki, E., 10.5–224
Sylvio, B. M., 10.5–128

Tabuteau, F., 10.5–62
Takagi, M., 10.5–178
Takeuti, T., 10.5–178
Tamura, T., 10E–98
Tanaka, Y., 10E–138
Tandberg-Hanssen, E., 10.5–210
Tarapygin, P. P., 10.5–140
Taylor, E. F., 10.5–149
Tcheng, Mao-lin, 10E–99
Teichert, F., 10E–128, 10E–160
Temple, J. W., 10E–103
Teweles, S., Jr., 10.5–78, 10.5–79, 10.5–80, 10.5–81
Texas. Agricultural and Mechanical College, 10.5–214
Thomas, J. O., 10.5–211
Thurston, W. R., 10.5–148
Thwaites, H. L., 10.5–329
Todd, C. J., 10.5–193
Tönsberg, E., 10E–140
Tousey, R., 10E–84, 10E–111, 10E–140
Treusch, C., 10.5–7
Tseĭtin, G. Kh., 10.5–227
Tsuberbiller, E. A., 10.5–304
Tu, Chan-Wan, 10.5–70
Tung, Ke-c., 10.5–239
Turkey. Devlet Meteoroloji Isleri Umum Mürülügü, 10.5–78
Tyler, J. E., 10.5–177

Ungeheuer, H., 10E–140
Unger, K., 10.5–167
U. S. Air Force. Geophysical Research Center, 10E–47
U. S. Corps of Engineers, Arctic Construction and Frost Effects Laboratory, Boston, 10.5–258
U. S. Hydrographic Office, 10.5–135; 10.5–136
U. S. National Advisory Committee for Aeronautics, 10.5–125
U. S. National Bureau of Standards, 10.5–204
U. S. National Science Foundation, 10.5–76
U. S. Quartermaster Research and Development Command, 10.5–95
U. S. Weather Bureau, 10.5–298
Unoki, S., 10.5–237
Unwin, R. S., 10.5–343
Ushijima, T., 10.5–238
Utah. University. Dept. of Physics, 10E–80, 10E–134
Uusitalo, S., 10.5–137

Vafiadi, V. G., 10E–25
Van Allen, J. A., 10E–129
Van Alstyne, P. C., 10.5–258
Van Mieghem, J., 10.5–89
Van Straelen, V., 10.5–54
Vassy, A., 10E–35, 10E–71, 10E–112, 10E–132, 10E–161
Vassy, E., 10E–22, 10E–71, 10E–100, 10E–161
Vavilov, Iu. N., 10.5–252
Venkatesan, D., 10.5–253
Vigroux, M., 10E–140
Vollprecht, R., 10.5–168
Volz, F., 10E–82, 10E–130
Vukmirović, D., 10.5–84

Wachter, H., 10.5–83
Wagner, R., 10.5–323
Wait, J. R., 10.5–212, 10.5–217
Walker, D. R., 10.5–168
Walton, G. F., 10E–140
Warwick, J. W., 10.5–213, 10.5–332
Washington (State). Univ. Dept. of Oceanography, 10.5–105
Watanabe, K., 10E–111, 10E–140
Weaver, W., 10.5–27
Weekes, K., 10.5–110
Weeks, W. F., 10.5–139
Wegener, A., 10.5–91
Werner, P. Wilh., 10.5–319
Westrip, G. M., 10E–121
Wexler, H., 10E–72, 10E–73
Whayne, T. F., 10.5–19
Whipple, F. L., 10.5–6, 10.5–49
Wilkins, E. M., 10.5–273
Wilks, S. S., 10.5–27
Williams, G. P., 10.5–308
Wilson, W. S., 10E–74, 10E–101
Wisconsin. Univ. Dept. of Met., 10.5–223
Wobus, H. B., 10.5–3
Woessner, R. H., 10.5–334
Wolcken, K., 10.5–91
Wong, M. S., 10.5–218
Woodcock, A. H., 10.5–329
Wulf, O. R., 10E–27
Wustmann, E., 10.5–35

Yamasaki, M., 10E–102

Zakharov, V. N., 10.5–74
Zamorskiĭ, A. D., 10.5–94
Zavarina, M. V., 10.5–36
Zelikoff, M., 10.5–121, 10.5–122, 10.5–206, 10.5–291
Zhdanov, G. B., 10.5–254
Zimmerman, G., 10E–162
Zirin, H., 10.5–213, 10.5–332

INDEX OF SUBJECTS

Absorption by sea water, 10.5–250
Abstracting, 10.5–98
Abstracting periodicals, 10.5–96
Acclimatization of cattle, 10.5–328
Adiabatic processes, 10.5–233
Advection, 10.5–180, 10.5–289
Advisory Group on Weather Modification (1951–54), 10.5–5
Aerodynamic heating, 10.5–118
Aerodynamics, 10.5–90, 10.5–122
Aerodynamics textbooks, 10.5–9
Aeronautical meteorology, 10.5–125
Aeronautical meteorology textbooks, 10.5–10, 10.5–17
Aerosols, 10E–85
Aerothermodynamics, 10.5–121
Agricultural climatology, 10.5–30, 10.5–320
Agricultural meteorology, 10.5–283
Agroclimatological handbooks, 10.5–119
Agrometeorological conferences, 10.5–74
Agrometeorological services, 10.5–68
Agrometeorological textbooks, 10.5–13, 105.–31

Air Data Computer (ADC) pressure requirements, 10.5–171
Air mass transformation, 10.5–227
Air-river temperature relationships, 10.5–261
Air sampling and analysis, 10.5–200, 10.5–204
Air sampling instruments, 10E–62
Aircraft accidents, 10.5–123
Alpine thunderstorms, 10.5–244
Annual hydrological reports, 10.5–24
Annual meteorological data summaries, 10.5–169
Annual ozone variations, 10E–33, 10E–54, 10E–57, 10E–64, 10E–83, 10E–87
Annual temperature variations, 10E–72
Antarctic expeditions, 10.5–60
Antarctic station equipment, 10.5–62
Anticyclonic subsidence, 10.5–249
Applied climatology, 10.5–14
Applied geophysics textbooks, 10.5–12
Applied meteorology, 10.5–155
Arabic abstracts, 10.5–86
Arctic diaries, 10.5–34
Argon phosphorescence, 10.5–176
Arid littorals, 10.5–305
Artificial ion clouds (NO), 10.5–291
Artificial microclimates, 10.5–30
Astronautics, 10.5–20
Astronomy, 10.5–6
Astrophysical observatories, 10.5–49
Astrophysics conferences, 10.5–1, 10.5–2
Atmospheric circulation, 10E–131
Atmospheric circulation anomalies, 10.5–265
Atmospheric composition, 10E–60, 10E–62, 10E–76, 10E–77, 10E–91
Atmospheric optics textbooks, 10.5–18
Atmospheric pollution control, 10.5–203
Atmospheric pollution effects, 10.5–203
Atmospheric pollution measurement techniques, 10.5–202, 10.5–204
Atmospheric potential gradients, 10.5–338
Atmospheric scattering, 10.5–18
Atmospheric structure, 10E–70, 10E–97
Atmospheric transparency, 10E–66, 10E–104
Atmospheric turbulence, 10.5–271
Aurora of Jan. 21–22, 1957, 10.5–341
Auroral ionization, 10.5–343
Auroral ionization detection, 10.5–216
Auroral observation techniques, 10.5–342
Auroral radiations, 10.5–256
Austausch, 10E–85
A.N.Z.A.A.S. Conference, Dunedin, N. Z., Jan. 1957, 10.5–75
Automatic ozone recorders, 10E–132
Automobile exhaust pollution, 10,5–204
Aviation forecast skill, 10.5–27

Bai-u circulation, 10.5–296
Balance equation, 10.5–235
Ball lightning, 10.5–339
Ballistic wind variability, 10.5–280
Balloon ascension rates, 10.5–172
Balloon bursting height, 10E–70
Balloons, 10E–62
Barographs, 10.5–87
Belgian Congo participation in IGY, 10.5–54
Biography of G. P. Douglas, 10.5–90
Biography of A. Wegener, 10.5–91
Blocking action, 10.5–232
Bumpiness, 10.5–271

Canadian participation in IGY, 10.5–48
Carbon dioxide absorption coefficients, 10E–134
Carbon dioxide in the atmosphere, 10.5–201
Carbon dioxide measurement techniques, 10.5–201
Carbon dioxide spectra, 10E–91
Cave temperatures, 10.4–324
Ceiling data, 10.5–292
Ceiling frequencies, 10.5–292
Central Radio Propagation Laboratory, 10.5–215
Cetyl alcohol, 10.5–285
Chappuis bands, 10E–3, 10E–12
Chemical analysis of nuclei, 10.5–202
Chemical ozone determination, 10E–21, 10E–32, 10E–7[illegible] 10E–76, 10E–115, 10E–128
Cherry trees, 10.5–166
Chromospheric eruptions, 10.5–230
Circulation effects on Bai-u, 10.5–296
Clear air turbulence, 10.5–270
Climate, 10.5–94
Climate of Addis Ababa, 10.5–320
Climate of Antarctica, 10.5–6
Climate of Bulgaria, 10.5–13
Climate of Ciechocinek, 10.5–321
Climate of Chelyabinsk Oblast, 10.5–119
Climate of Kazakh SSR, 10.5–74
Climate of Leningrad, 10.5–1
Climatic changes, 10.5–29
Climatic changes in Ukraine, 10.5–22
Climatic effects on soil, 10.5–327
Climatic variations, 10.5–58
Climatic zones, 10.5–321
Climatological methodology, 10.5–15
Climatology, 10.5–79
Climatology textbooks, 10.5–14
Clothing climate, 10.5–329
Cloud modification projects, 10.5–5
Cloud physics, 10.5–123, 10.5–192
Cloud physics experiments, 10.5–26
Cloud seeding, 10.5–192
Cloud seeding effects, 10.5–193
Cloud seeding evaluation, 10.5–5, 10.5–193
Cloud seeding in Madagascar, 10.5–194
Cloud seeding projects, 10.5–193
Cloud seeding with silver iodide, 10.5–193, 10.5–195
Coal mine atmospheres, 10.5–269
Coastal climates, 10.5–305
Cold air advection aloft, 10.5–179
Cold injury to skin, 10.5–19
Cold waves, 10.5–232
Communication networks conferences, 10.5–56
Computation tables, 10E–143

Conference on Atmospheric Ozone, Oxford, 1936, 10E–24
Conservation, 10.5–36
Constant vorticity trajectory slide rules, 10.5–163
Continuous atmospheric turbulence, 10.5–272
Convective rainfall, 10.5–186
Convergence line-precipitation relationships, 10.5–219
Cool summer, 1958, 10.5–265
Corpuscular radiation, 10.5–255
Cosmic noise variations, 10.5–213
Cosmic ray instruments, 10.5–254
Cosmic ray mesons, 10.5–254
Cosmic ray-nuclear-active particle relationship, 10.5–252
Cosmic ray penetrating showers, 10.5–254
Cosmic ray periodicities, 10.5–253
Cosmic ray showers, 10.5–252
Cotton, 10.5–150
Cyclone distribution, 10.5–185

Definitions, 10.5–94
Diffusion coefficient, 10.5–273
Disaster relief, 10.5–152
Dispersion of contaminants, 10.5–102
Diurnal ionospheric variations, 10.5–207, 10.5–209
Diurnal ozone variations, 10E–32, 10E–124, 10E–153
Diurnal pressure variations, 10.5–268
Diurnal temperature variations, 10.5–263, 10E–72
Dobson spectrophotometer, 10E–28
Doppler effect, 10.5–110
Drained swamp microclimatology, 10.5–322
Drained swamp temperatures, 10.5–322
Drift ice meteorological stations, 10.5–34
Drought, 10.5–36
Drought bibliographies, 10.5–83
Drought, Greece (Feb. 1957), 10.5–301
Drought, Middle Atlantic States (1957), 10.5–302
Drought periods, 10.5–303
Drought relieving storms, 10.5–302
Dry periods, 10.5–304
Dust bibliographies, 10.5–11
Dust in stratosphere, 10.5–205
Dust textbooks, 10.5–11
Dynamic meteorology textbooks, 10.5–8

E layer, 10E–157
Eclipse effects on ionosphere, 10.5–208
Eddy diffusivity coefficient, 10.5–221
Effective radiation, 10.5–251
Effective radiation temperature, 10E–47
Elbrus Expedition, 1934–1935, 10E–25
Electric field meters, 10.5–178
Electrical charges near the ground, 10.5–333
Electrical charges on drops, 10.5–288
Electrical conductivity of air, 10.5–221, 10.5–333
Electrical conductivity of rainwater, 10.5–340
Electrification of clouds, 10.5–331
Electron density in F layers, 10.5–211
Electronic computers, 10.5–188
Electrophotometry, 10E–104
Elementary meteorology, 10.5–33
Energy budget, 10.5–223
Energy exchange earth-atmosphere, 10.5–223
Energy sources, 10.5–154
Energy transfer, 10.5–225
English-Russian oceanographic glossary, 10.5–37
Environmental physiology, 10.5–325
Environmental research bibliographies, 10.5–95
Erythema light sensitivity, 10.5–158
Eulerian time-space relationships, 10.5–226
Evaporation from forests and prairies, 10.5–130
Evaporation from soil, 10.5–284
Evaporation from water surfaces, 10.5–101, 10.5–227
Evaporation investigations, 10.5–4
Evaporation reduction from reservoirs, 10.5–285
Evapotranspiration, 10.5–286
Evapotranspiration research projects, 10.5–283
Excessive rainfall, 10.5–179
Expansion chambers, 10.5–196
Expeditionary data, 10.5–60
Expédition Polaires Françaises, 10.5–60, 10.5–62
Explosion waves, 10.5–267
Explosions in coal mines, 10.5–269
Extended forecast verification, 10.5–27

F layer tilts, 10.5–216
F region, 10.5–209
F1 layer height-magnetic storm relationships, 10.5–210
Filter radiometry, 10E–159
Fisheries weather forecasting, 10.5–144
Fishing, 10.5–147
Fishing industry, 10.5–144
Flood damage, 10.5–312
Flood relief, 10.5–152
Flood wave analysis, 10.5–160
Flooded mines, 10.5–318
Floods, United States (1952–55), 10.5–312
Fluorescein, 10E–160
Fog, Kurile Islands, 10.5–25
Fog climatology, 10.5–25
Fog distribution, 10.5–289
Fog frequencies, 10.5–290
Fog statistics, 10.5–25
Forecast errors, 10.5–179 to 10.5–182, 10.5–186
Forecast verification, 10.5–180, 10.5–181
Forest management, 10.5–126
Forest meteorology, 10.5–128
Forest microclimates, 10.5–127, 10.5–129, 10.5–130
Freezing nuclei, 10.5–193
French meteorological service, 10.5–65
Frontal analysis, 10.5–183
Fronts, 10.5–124

Gale frequencies, 10.5–21
General circulation, 10.5–8, 105.–228 to 10.5–230
Geochemical methods, 10.5–12
Geomagnetic observations, 10.5–64
Geophysical research, 10.5–53
Geothermal techniques, 10.5–12
Glacier photographs, 10.5–35
Gliding flights, 10.5–124
Graphical forecasting models, 10.5–190
Green flash, 10.5–7
Green flash bibliographies, 10.5–7
Green flash photographs, 10.5–7
Greenland ice thickness, 10.5–133
Ground water movements, 10.5–319

Ground water oscillations, 10.5–318
Ground wave field, 10.5–217

Hail prevention, 10.5–311
Hail research, 10.5–311
Hartley bands, 10E–4
Heat absorption by stratospheric dust, 10.5–205
Heat balance, 10E–142
Heat tolerance, 10.5–157
Heat wave effects on consumer selectivity of food, 10.5–146
Heat waves, 10.5–184
Heavy water content of glaciers, 10.5–132
High atmosphere densities, 10.5–199
High speed engines, 10.5–122
Historic droughts, 10.5–82
Historic temperature records, 10.5–86
Historical climates, 10.5–22
History of Czechoslovak meteorology, 10.5–85
History of droughts, 10.5–82
History of hydrology, 10.5–67
History of hydrometeorological services, 10.5–73
History of meteorological observations, 10.5–88
History of meteorology, 10.5–83
History of Minsk Weather Bureau, 10.5–69
History of observatories, 10.5–71
History of radiosonde, 10.5–84
Homogeneity, 10.5–257
Huggins bands, 10E–5, 10E–36
Hungarian Hydrological Service, 10.5–67
Hurricane, New England (1938), 10.5–126
Hurricane damage, 10.5–126
Hurricane relief, 10.5–152
Hydrodynamics of rivers, 10.5–160
Hydrodynamics textbooks, 10.5–9
Hydrographs, 10.5–316
Hydrologic networks, 10.5–67
Hydrologic services, 10.5–66
Hydrology yearbooks, 10.5–24
Hydrometeorological services, 10.5–144
Hypersonic flights, 10.5–121

Ice age theories, 10.5–131
Ice breakup forecasting, 10.5–134
Ice crystal growth, 10.5–309
Ice density measurements, 10.5–58
Ice exploration, 10.5–35
Ice formation, 10.5–144
Ice mound bursting, 10.5–141
Ice, Neva River, 10.5–16
Ice pressure, 10.5–138
Ice pressure gages, 10.5–142
Ice thickness measurement techniques, 10.5–59, 10.5–140
Icing of aircraft, 10.5–26
Icing research, 10.5–125
Information retrieval, 10.5–97
Infrared absorption spectrum, 10E–158
Infrared radiation, 10E–134
Infrared spectrum of ozone, 10E–80
International Geophysical Year, 1957–1958, 10.5–42, 10.5–51
IGY astronomical program, 10.5–50
IGY data centers, 10.5–46
IGY geodetic program, 10.5–50
IGY meteorological program, 10.5–46
IGY networks, 10.5–43, 10.5–47
IGY World Warning Agency, 10.5–45
International meteorological cooperation, 10.5–55
International Symposium on Atmospheric Ozone, Univ. of Oxford, Sept. 2–4, 1952, 10E–139
Inversion-precipitation relationships, 10.5–305
Ionospheric disturbances, 10.5–209, 10E–81
Ionospheric electron density, 10.5–207, 10.5–211, 10.5–213
Ionospheric heights, 10.5–210
Ionospheric ionization, 10.5–208
Ionospheric radio wave propagation, 10.5–212
Ionospheric radio wave reflection, 10.5–216
Irreversible processes in meteorology, 10.5–224
Isotropic turbulence, 10.5–120

Japanese Antarctic Research Expedition, 1956–57, 10.5–64
Japanese language, 10.5–38
Japanese participation in IGY, 10.5–43
Jet stream turbulence, 10.5–270

Karst, 10.5–324
Kinetic energy in atmosphere, 10.5–220, 10.5–233

Laboratory experiments, 10E–160
Land and sea breezes, 10.5–2
Landau theory, 10.5–252
Laplace transformation method, 10.5–319
Layer of maximum wind, 10.5–190
Lee waves, 10.5–276
Length of growing season, 10.5–168
Light ion conductivity measurement techniques, 10.5–334
Light-metal equipment, 10.5–62
Lightning discharges, 10.5–3
Lightning photography, 10.5–337
Lightning stroke velocities, 10.5–335
Lightning strokes, 10.5–337
Limnology, 10.5–4
Linear equations, 10.5–159
Linear interpolation, 10.5–15
Local objective forecasting, 10.5–189
Long period precipitation records, 10.5–293
Long range forecasting skill, 10.5–27
Long range ice forecasting, 10.5–135, 10.5–136
Long wave radiation absorption by ozone, 10E–142
Lunar eclipses, 10E–50, 10E–92, 10E–93, 10E–117, 10E–118
Lyman alpha radiation in ionosphere, 10.5–332

Machine data analysis, 10.5–220
Magnetic activity, 10.5–230
Magnetic storms, 10.5–210
Maple trees, 10.5–165
Marine meteorology publications, 10.5–41
Mathematics for meteorologists, 10.5–81
Maximum wind forecasting, 10.5–191
Mean pressure charts, 10.5–2
Mercury barometer accuracy, 10.5–171
Meteor-radiant distribution, 10.5–330
Meteoric dust nucleation, 10.5–198
Meteorological data forms for IGY, 10.5–48
Meteorological glossaries, 10.5–38

eteorological instruments, 10.5–80
eteorological research, 10.5–70, 10.5–71
eteorological research, Italy, 10.5–99
eteorological research institutes, 10.5–83
eteorological societies, 10.5–83
eteorology textbooks, 10.5–78
icroclimatic influences on agriculture, 10.5–30
icroclimatic ozone measurements, 10E–162
icrowave propagation studies, 10.5–214
icrowave refraction, 10.5–214
ilitary bioclimatology, 10.5–19
ilitary forecasts, 10.5–27
ilitary hydrology, 10.5–314
obile temperature surveys, 10.5–262
onthly mean geostrophic winds, 10.5–279
oonwatch observational data, 10.5–113
oonwatch stations, 10.5–116
ountain and valley winds, 10.5–259

acreous clouds, 10E–113
atural radioactivity measurement techniques, 10.5–12
egative ion conductivity, 10.5–334
ephelometers, 10.5–177
etworks, 10.5–73
ew England hurricane, 1938, 10.5–126
ight airglow, 10E–137
itric oxide, 10.5–213
itrous oxide, 10.5–206
octilucent cloud observation manuals, 10.5–39
octurnal minimum temperature forecasting, 10.5–187
octurnal temperature rise, 10.5–259
omographs, 10.5–163
ucleation, 10.5–287
ucleation by volatile metallic particles, 10.5–198
uclei adsorption properties, 10.5–287
uclei formation boxes, 10.5–196
umerical forecasting, 10.5–8
umerical temperature forecasting, 10.5–188
umerical typhoon forecasting, 10.5–235

Obituary of Josef Gutmann, 10.5–92
Obituary of Friedrich Rosenkranz, 10.5–93
Obituary of C.-G. Rossby, 10.5–89
Observation techniques, 10.5–80
Observers manuals, 10.5–39
Ocean waves in typhoons, 10.5–237
Ocean Weather Station Tango, 10.5–101
Oceanographic chemistry, 10.5–105
Oceanographic cruise data, 10.5–103, 10.5–104
Oceanographic instruments, 10.5–100
Oceanographic observations 10.5–105
Oil industry, 10.5–149
Orographic effects on zonal current, 10.5–222
Oysters, 10.5–143
Ozone, 10E–1, 10E–29, 10E–37, 10E–41, 10E–66, 10E–77, 10E–94, 10E–114, 10E–123, 10E–130, 10E–134, 10E–143
Ozone absorption, 10E–6, 10E–80, 10E–141, 10E–158
Ozone absorption coefficients, 10E–35, 10E–36, 10E–138
Ozone absorption of incoming radiation, 10E–12
Ozone absorption spectra, 10E–2 to 10E–5, 10E–7, 10E–91, 10E–142
Ozone-air mass relationships, 10E–22, 10E–82, 10E–135
Ozone analysis, 10E–126
Ozone-atmospheric circulation relationships, 10E–42, 10E–58, 10E–96
Ozone balance in stratosphere, 10E–152
Ozone-cloudiness relationships, 10E–20, 10E–90
Ozone concentration, 10E–67, 10E–75, 10E–131
Ozone conferences, 10E–13, 10E–24, 10E–139
Ozone-cyclone relationships, 10E–18, 10E–40
Ozone data, 10E–9, 10E–10, 10E–26, 10E–28, 10E–33, 10E–34, 10E–49, 10E–51, 10E–63, 10E–99, 10E–109, 10E–135
Ozone decomposition, 10E–136
Ozone density variations, 10E–38
Ozone determination, 10E–101, 10E–132
Ozone distribution, 10E–19, 10E–27, 10E–83, 10E–87, 10E–90, 10E–100, 10E–105, 10E–111, 10E–150, 10E–154, 10E–155
Ozone distribution at high altitudes, 10E–23
Ozone distribution in upper atmosphere, 10E–129
Ozone effect on balloons, 10E–70
Ozone effects, 10E–120
Ozone height determination, 10E–44
Ozone height variations, 10E–11
Ozone-humidity relationships, 10E–149
Ozone in Arctic, 10E–16, 10E–21, 10E–22, 10E–74, 10E–151
Ozone in troposphere, 10E–82, 10E–101, 10E–149
Ozone layer, 10E–44, 10E–48, 10E–50, 10E–55, 10E–71, 10E–78, 10E–92, 10E–137, 10E–151, 10E–157
Ozone layer height, 10E–8
Ozone measurement techniques, 10E–15, 10E–20, 10E–74, 10E–79, 10E–86, 10E–93, 10E–99, 10E–105, 10E–108, 10E–111, 10E–121, 10E–126
Ozone measurements, 10E–103, 10E–106, 10E–107, 10E–109, 10E–116, 10E–140, 10E–156, 10E–159, 10E–160
Ozone meters, 10E–25, 10E–48, 10E–54, 10E–88, 10E–83, 10E–95, 10E–106, 10E–108, 10E–110, 10E–128, 10E–144
Ozone mixing ratio, 10E–89
Ozone molecule structure, 10E–80
Ozone monographs, 10E–42, 10E–53
Ozone near the ground, 10E–116, 10E–162
Ozone networks, 10E–54, 10E–95, 10E–133
Ozone photochemistry, 10E–14, 10E–17, 10E–38, 10E–139
Ozone photolysis, 10E–60
Ozone-pressure relationships, 10E–9
Ozone research, 10E–15, 10E–54, 10E–56, 10E–63
Ozone shadow, 10E–45, 10E–92
Ozone spectrophotometers, 10E–133
Ozone spectroscopy, 10E–161

Ozone symposia, 10E–48, 10E–140
Ozone-synoptic relationships, 10E–28, 10E–89
Ozone textbooks, 10E–56, 10E–95
Ozone theories, 10E–15
Ozone thickness, 10E–127
Ozone variations, 10E–9, 10E–12, 10E–14, 10E–53, 10E–81, 10E–103, 10E–105, 10E–112, 10E–113, 10E–119, 10E–125, 10E–146, 10E–148
Ozone-vertical motion relationships, 10E–68
Ozone-weather relationships, 10E–31, 10E–32, 10E–39, 10E–65, 10E–119
Ozonesondes, 10E–46, 10E–98, 10E–144, 10E–145, 10E–147
Ozonosphere, 10E–73, 10E–114
Ozonosphere heating, 10E–78
Ozonosphere temperature measurement techniques, 10E–161
Ozonosphere temperatures, 10E–43, 10E–47, 10E–112

Phenological forecasting, 10.5–165
Phenological observations, 10.5–166, 10.5–167
Phenological studies, 10.5–168
Photochemical equilibrium of ozone, 10E–17, 10E–42, 10E–53
Photochemical theory of ozone, 10E–27, 10E–38, 10E–40, 10E–61, 10E–140
Photochemistry, 10.5–206
Photochemistry of upper atmosphere, 10E–77, 10E–152
Photoelectric spectrometers, 10E–58
Photolysis, 10.5–206
Physical climatology, 10.5–14
Physical geography, Neva River, 10.5–16
Plant dryness, 10.5–278
Plant weight increase, 10.5–167
Point current-potential gradient relationships, 10.5–336
Point discharge-potential gradient-wind speed relationships, 10.5–338
Polish observatories, 10.5–47
Polish participation in IGY, 10.5–47
Polish weather service, 10.5–77
Pollen analysis, 10.5–128
Popular meteorology, 10.5–36
Positive ion conductivity, 10.5–334
Potential evapotranspiration, 10.5–303
Potential temperature field of typhoons, 10.5–236
Precipitable water, 10E–100
Precipitation amount, 10.5–295, 10.5–316
Precipitation analysis, 10.5–305
Precipitation controls, 10.5–305
Precipitation data, 10.5–24
Precipitation distribution, 10.5–294
Precipitation effects on cotton, 10.5–150
Precipitation forecasting, 10.5–190
Precipitation measurement in mountains, 10.5–295
Precipitation normals, 10.5–293
Pressure effects on coal mine air, 10.5–269
Pressure fields, 10.5–182
Pressure variations, 10.5–268, 10E–73
Prognostic upper air chart preparation, 10.5–3
Progress in astronomy, 10.5–6
Progress in meteorology, 10.5–70
Project Cloud Trail, 10.5–270
Project Vanguard, 10.5–117
Pyrgeometers, 10E–86

Quartz spectrographs, 10E–129

Racial differences in heat tolerance, 10.5–157
Radar analysis of typhoon rainfall, 10.5–238
Radar observation of auroras, 10.5–164, 10.5–342
Radarsondes, 10.5–174
Radiation attenuation by smoke, 10.5–251
Radiation balance, 10E–41
Radiation data, 10E–16
Radiation effects on ozone distribution, 10E–27
Radiation fog, 10.5–289
Radiation fog forecasting, 10.5–187
Radiation penetration method, 10.5–167
Radiative transfer, 10E–134
Radio astronomy research, 10.5–23
Radio communication by meteor trails, 10.5–330
Radio frequency radiation, 10.5–255
Radio meteorological da 10.5–215
Radio meteorological d center, 10.5–215
Radio noise, 10.5–256
Radio wave propagation, 1 218
Radioactive fallout, 10.5–2
Radioactive isotopes, 10.5–
Radioactive waste dispo 10.5–148
Radioactive wastes in wa 10.5–153
Radioactivity in rainwa 10.5–200, 10.5–333
Radiosonde manuals, 10.5–
Radiosondes, 10.5–40
Rain gages, 10.5–173
Rainfall amount, 10.5–301
Rainfall duration intens thunder relationships, 1 299
Rainfall forecasting, 10.5–1
Rainfall influences, 10.5–16
Rainfall intensity-electri relationships, 10.5–340
Rainfall intensity-frequency gime, 10.5–298
Rainfall intensity-thund storm relationships, 10.5–
Rainfall trends, 10.5–297
Rainfall-typhoon relationsh 10.5–300
Rainfall variability, 10.5–29
Random variables, 10.5–16
Record drought, 10.5–302
Refraction anomalies, 10.5–
Regression equations, 10.5–
Research grants in geophys 10.5–76
Research grants in mete ology, 10.5–76
Reservoirs, 10.5–313
Resultant wind charts, 1 279
Réunion de l'Ozone et l'Absorption Atmosphériq Paris, 1929, 10E–13
Rice culture, 10.5–323
Rice paddy microclimatolo 10.5–323
River alimentation, 10.5–3
River discharges, 10.5–315
River flow, 10.5–316
River gages, 10.5–314
River ice structure, 10.5–1
River level calculations, 1 313
River temperatures, 10.5–2
Rocket data, 10.5–141
Rocket development, 10.5–
Rocket instrumentation, 1 129

ɔcket pressure instruments, 10.5–170
ɔcket research, 10.5–118
ɔcket soundings, 10E–84, 10E–140
ɔcketry, 10.5–20
ɔtating mirror spectrographs, 10.5–176
ɪssian-English oceanographic glossary, 10.5–37

les meteorology, 10.5–146
lt content of ice, 10.5–137
lt production, 10.5–145
tellite communication, 10.5–110
tellite observational data, 10.5–116
tellite observations, 10.5–199
tellite observatories, 10.5–20, 10.5–117
tellite orbit data, 10.5–111, 10.5–112, 10.5–114, 10.5–115
tellite orbits, 10.5–107
tellite tracking, 10.5–49, 10.5–107, 10.5–108, 10.5–109
ttering of light, 10.5–331, 10E–59
ience congresses, 10.5–75
intillation counters, 10.5–175
a breeze hodographs, 10.5–162
a ice formation forecasting, 10.5–134
a ice melting, 10.5–134
a ice thrust structures, 10.5–139
a temperatures, 10.5–147
asonal ionospheric variations, 10.5–209
asonal ozone variation, 10E–52
asonal rainfall trends, 10.5–297
smic ice soundings, 10.5–133
rial publications, 10.5–41
ock tubes, 10.5–122
ort range forecasting, 10.5–181
owalter's Stability Index, 10.5–246
icone measurement of droplet charge, 10.5–288
ver iodide decay, 10.5–197
ius, 10E–5
in sensitivity, 10.5–158
in temperatures, 10.5–156
og, 10.5–203
oke puff diffusion experiments, 10.5–273
ow accumulation in gully-ravine areas, 10.5–275
ow cover thickness, 10.5–307
Snow cover-vegetation relationships, 10.5–310
Snow density, 10.5–307
Snow depth date, 10.5–306
Snow depth forecasting, 10.5–306
Snow depth variations, 10.5–306
Snow surveys, 10.5–308
Snow transport by blizzards, 10.5–275
Soil formation, 10.5–327
Soil moisture deficiency, 10.5–303
Soil temperature measurement techniques, 10.5–258
Solar activity, 10.5–32, 10.5–230, 10.5–255
Solar astrophysics investigations, 10.5–23
Solar eclipses, 10.5–208
Solar energy, 10.5–154
Solar effects on cosmic rays, 10.5–253
Solar-ionospheric relations, 10.5–207
Solar radiation, 10.5–49
Solar radiation absorption, 10.5–250
Solar radiation effects on sea temperatures, 10.5–250
Solar spectrum, 10E–158
Solar-terrestrial relationships, 10.5–32
Solar-weather relationships, 10E–94
Sonic anemometers, 10.5–223
Soot falls, 10.5–202
Sounding balloons, 10E–70
Southern Hemisphere westerlies, 10.5–231
Southern Ocean analysis, 10.5–185
Soviet ice floe stations, 10.5–34
Soviet participation in IGY, 10.5–53
Space flight, 10.5–20
Spectrographs, 10E–102
Spectrophotometric ozone determination, 10E–126
Spectroscopic ozone measurement techniques, 10E–22, 10E–25, 10E–99, 10E–102
Spectroscopy, 10E–95
Sputniks, 10.5–111
Stability index, 10.5–246
Static stability, 10.5–233
Stationary anticyclones, 10.5–248
Statistical mechanics in meteorology, 10.5–224
Statistical methods in climatology, 10.5–15
Statistical spectra, 10.5–281
Statistics in meteorology, 10.5–161
Stellar spectroscopy, 10E–7, 10E–22
Stratosphere balloon ascents, 10E–26, 10E–34
Stratospheric composition, 10E–41
Stratospheric density, 10E–10
Stratospheric temperatures, 10.5–63, 10E–10, 10E–125, 10E–141
Stratospheric vertical mixing, 10.5–205
Stratospheric winds, 10E–157
Strength of ice, 10.5–138
Sudden cosmic noise absorption, 10.5–332
Sukhovei effects, 10.5–277
Sukhovei effects on agriculture, 10.5–304
Sukhovei effects on plants, 10.5–278
Summer precipitation, 10.5–294
Sunlight effects, 10E–120
Sweat measurement apparatus, 10.5–156
Symposium on Atmospheric Ozone, Brussels, 1951, 10E–140
Synoptic analysis, 10.5–179, 10.5–180, 10.5–184, 10.5–186
Synoptic case history studies, 10.5–302
Synoptic conditions for fog, 10.5–25, 10.5–289
Synoptic conditions for drought, 10.5–301
SAPLOFS, 10.5–189

Teaching of meteorology, 10.5–65
Temperature anomaly forecasting, 10.5–188
Temperature comparisons, 10.5–263
Temperature effects on snow, 10.5–307
Temperature instruments, 10.5–258
Temperature measurement techniques, 10.5–258
Temperature measurement errors, 10.5–258
Temperature regime, 10.5–260
Theodolite observation errors, 10.5–172
"Theodore N. Gill" Cruise, 1953, 10.5–103, 10.5–104
Thermosphere, 10.5–199
Thunderstorm data, 10.5–245
Thunderstorm electricity, 10.5–333, 10.5–337

Thunderstorm frequencies, 10.5–290
Thunderstorm probabilities, 10.5–245
Thunderstorms, 10.5–180, 10.5–299, 10.5–246
Tidal effects, 10.5–318
Titanium phototubes, 10E–159
Training courses in meteorology, 10.5–78 to 10.5–80
Trajectographs, 10.5–163
Translations, 10.5–33, 10.5–39, 10.5–78, 10.5–205
Transmission of reports, 10.5–56
Tropical climates, 10.5–328
Tropics, 10.5–328
Tropopause data, 10.5–57
Tropopause height, 10E–41
Tropopause-ozone relationships, 10E–10
Tropopause temperatures, 10E–41
Tropospheric radio wave propagation textbooks, 10.5–28
Tropospheric radio wave propagation, 10.5–217
Turbulence estimation, 10.5–271
Turbulence spectra, 10.5–226, 10.5–272
Turbulence theories, 10.5–161
Turbulent diffusion, 10.5–227
Turbulent mixing, 10.5–120
Turkish language, 10.5–81
Twilight phenomena, 10E–137
200 mb jet stream, 10.5–279
Typhoon "Carmen" (1957), 240
Typhoon "Faye" (1957), 10.5–241
Typhoon "Gloria" (1957), 10.5–241
Typhoon "Virginia" (1957), 10.5–242
Typhoon damage, 10.5–240
Typhoon movement, 10.5–240
Typhoon movement forecasting, 10.5–238
Typhoon precipitation distribution, 10.5–239
Typhoon rainfall, 10.5–300
Typhoon rainfall structure, 10.5–238
Typhoon recurvature, 10.5–242
Typhoon structure, 10.5–239
Typhoon temperature, 10.5–236
Typhoon tracks, 10.5–234, 10.5–241, 10.5–242
Typhoon waves, 10.5–237

Ultraviolet absorption, 10E–6, 10E–34, 10E–35, 10E–123
Ultraviolet intensity meters, 10E–98
Ultraviolet light, 10E–66
Ultraviolet light effects on nuclei, 10.5–197
Ultraviolet radiation, 10.5–255, 10E–78
Ultraviolet radiation data, 10E–127
Ultraviolet radiation measurement techniques, 10.5–158
Ultraviolet spectra, 10E–25, 10E–104, 10E–138
Umkehr effect, 10E–16, 10E–59, 10E–99, 10E–140
Underwater pyranometers, 10.5–250
U.S.S.R. agrometeorological services, 10.5–31
U.S.S.R. Central Institute of Forecasting, 10.5–71, 10.5–72
U.S.S.R. Hydrometeorological Service, 10.5–73
U.S.S.R. satellite, Alpha one, 10.5–111, 10.5–112, 10.5–113, 10.5–116
U.S.S.R. satellite, Alpha two, 10.5–111, 10.5–112, 10.5–114, 10.5–116
U.S.S.R. satellite Beta one, 10.5–108, 10.5–112 to 10.5–116
U.S.S.R. satellites, 1957, 10.5–112, 10.5–116
U. S./I.G.Y. rocket program, 10.5–44
U. S. participation in IGY, 10.5–52
Unstable water movement in channels, 10.5–160
Upper air analysis, 10.5–3
Upper air data, 10.5–57
Upper air measurement techniques, 10.5–174
Upper air pressure variations, 10.5–268
Upper air temperatures, 10.5–199, 10E–55, 10E–57, 10E–71, 10E–72
Upper air wind variability, 10.5–280
Upper air winds, 10E–65
Upper atmosphere, 10.5–206, 10E–77, 10E–87, 10E–124
Upper atmosphere research, 10.5–33
Urban climatology, 10.5–262
Urban temperature variations, 10.5–262
Urban temperatures, 10.5–263

Vasometer reflexes, 10.5–325
Vector correlation coefficient, 10.5–274
Vertical currents, 10.5–282
Vertical displacement-precipitation nomograms, 10.5–21
Vertical eddy flux, 10E–155
Vertical motion, 10E–146
Vertical ozone distributio 10E–23, 10E–26, 10E–3 10E–34, 10E–49, 10E–5 10E–59, 10E–67, 10E–6 10E–84, 10E–85, 10E–8 10E–93, 10E–97, 10E–1 to 10E–119, 10E–122 10E–124, 10E–140, 10E–15 10E–152
Vertical ozone transport, 10 96
Vertical turbulent exchan 10.5–282
Vertical velocities, 10.5–282
Vertical wind analysis, 10.5–2
VLF radio wave propagatio 10.5–212
Visual satellite observatio 10.5–113
Vorticity advection-typho relationships, 10.5–234

Warm anticyclones, 10.5–24
Water discharge measureme techniques, 10.5–315
Water loss investigations, 10. 4
Water pollution, 10.5–102
Water resources, 10.5–195
Water table, 10.5–284
Water temperature determi tion, 10.5–106
Water temperatures, 10.5–14
Water vapor profiles, 10E–13
Waterspout observation, 10. 243
Wave guide mode theory VLF propagation, 10.5–21
Wave motion, 10.5–160
Waves in the westerlies, 10. 225
Weather broadcasting, 10.5–
Weather disasters, 10.5–152
Weather effects on cardiac farction, 10.5–326
Weather effects on fishi 10.5–147
Weather effects on nervo system, 10.5–326
Weather effects of oil indust 10.5–149
Weather effects on oys growth, 10.5–143
Weather effects on ulcers, 10 326
Weather effects on vacatio 10.5–151
Weather extremes, 10.5–149
Weather forecasting, 10.5– 10.5–72

eather modification, 10.5–192
et-cold effects, 10.5–19
ind-chill data, 10.5–19
ind conditions over reservoirs, 10.5–21
ind correlation calculation, 10.5–274
Wind duration frequency data, 10.5–21
Wind energy, 10.5–154
Wind holes, 10.5–324
Wind power surveys, 10.5–21
Wind velocity distribution, 10.5–101
Winter temperatures, 10.5–264
Yamaji wind, 10.5–276
Yearbooks, 10.5–23
Yugoslav weather service, 10.5–77

Zenith scattered light intensity, 10E–67
Zonal currents, 10.5–222

INDEX OF GEOGRAPHICAL LOCATIONS

FRICA
East Africa, 10.5–285

Afghanistan
Kabul, 10E–112
Algeria, 10.5–195
Angola, 10.5–150
Belgian Congo, 10.5–54
Ethiopia
Addis Ababa, 10.5–320
Madagascar, 10.5–194

SIA, 10.5–296
East Asia, 10.5–228

China, 10.5–70
South China, 10.5–239
Zô-Sè Observatory, 10E–28
Formosa, 10.5–240
Taiwan, 10.5–241, 10.5–242
Hong Kong, 10.5–241
India, 10E–49, 10E–153
Bombay, 10E–33
Calcutta, 10.5–340
Delhi, 10E–67
Israel, 10.5–24
Japan, 10.5–43, 10.5–165, 10.5–276
Fukuoka, 10.5–303
Kumano Sea, 10.5–147
Mt. Fuji, 10E–20
Noto Peninsula, 10.5–166
Saga Prefecture, 10.5–300
Setonaikai Island, 10.5–259
Sea of Okhotsk, 10.5–247
U.S.S.R. (in Asia), *See also* U.S.S.R. *under* Europe
Chelyabinsk Oblast, 10.5–119
Kazakh SSR, 10.5–74
Kurile Islands, 10.5–25
Vietnam, 10.5–47

UROPE, 10.5–184, 10E–54, 10E–65
Alps, 10E–161
Baltic
Western Baltic, 10.5–134
Bulgaria, 10.5–13
Czechoslovakia, 10.5–85
Brno, 10.5–263
Finland
Finnish coast, 10.5–137
Helsinki, 10.5–138, 10.5–142
Great Britain, 10.5–297
England
Slough, 10.5–211
Wittering, 10.5–187
Scotland
Scottish Highlands, 10.5–310
France
Mont-Ventoux, 10E–35
Paris, 10.5–56
Val-Joyeux, 10E–132
Germany, 10.5–318
Bad Kissingen, 10E–162
Bad Tölz, 10.5–306
Baden, 10E–116
Frankfurt a.M., 10.5–83, 10.5–260
Hamburg, 10.5–260
Lindenberg, 10E–10
Nebelhorn, 10E–90, 10E–149
Oberstdorf, 10E–90, 10E–149
Potsdam, 10E–109
Weissenau, 10E–69
West Germany, 10.5–17
Greece, 10.5–301
Athens, 10.5–246
Heligoland Bight, 10.5–134
Hungary, 10.5–67, 10.5–127, 10.5–261
Kopancs, 10.5–323
Italy, 10.5–99, 10.5–293
Italian Alps, 10.5–244
Tarquinia, 10.5–145
Netherlands
Delft, 10.5–50
Norway, 10E–64
Tromsö, 10E–23, 10E–140
Poland, 10.5–47, 10.5–88
Ciechocinek, 10.5–321
Rhône Basin, 10.5–132
Romania, 10.5–316, 10.5–317
Sweden
Abisko, 10E–22, 10E–71
Switzerland, 10.5–10, 10.5–124
Aar Basin, 10.5–132
Arosa, 10E–11, 10E–82, 10E–99
Geneva, 10.5–46
Sentier, 10.5–290
U.S.S.R. (European and general), 10.5–31, 10.5–36, 10.5–68, 10.5–71 to 10.5–73, 10.5–82, 10.5–245, 10.5–248, 10.5–324, 10.5–341, 10E–66, 10E–104
Northwest U.S.S.R., 10.5–322
Southeast European U.S.S.R., 10.5–277
Caspian Sea, 10.5–144
Don River Basin, 10.5–275, 10.5–313
Don-Volga Basin, 10.5–21
Lake Ladoga, 10.5–16
Leningrad, 10.5–16
Minsk (Byelorussian S.S.R.), 10.5–69
Moscow, 10.5–179, 10.5–180, 10.5–181, 10.5–182
Moscow Region, 10.5–294
Mt. Elbrus, 10E–25
Neva River, 10.5–16
Novgorod Oblast, 10.5–289
Pskov Oblast, 10.5–289
Southern Caucasus, 10.5–232
Ukraine, 10.5–22
Ural Mts., 10.5–282
Yugoslavia
Crikvenica, 10.5–264
Osijek, 10.5–264
NORTH AMERICA, 10.5–27
Canada, 10.5–48, 10.5–128, 10.5–308
Alberta
Edmonton, 10E–135, 10E–140
Labrador Coast, 10.5–139

Manitoba
Fort Churchill, 10.5–44
Winnipeg, 10.5–262
Nova Scotia
Halifax, 10.5–162
Ontario
Ottawa, 10.5–307
Greenland, 10.5–35, 10.5–59, 10.5–133
Eismitte, 10.5–58
Greenland Ice Cap, 10.5–59, 10.5–133
Scoresby Sound, 10E–21
Wolstenholme Fjord, 10.5–139
United States, 10.5–66, 10.5–192, 10.5–265, 10.5–270, 10.5–279, 10.5–283, 10.5–312
Chesapeake Bay, 10.5–143
Lake Mead (Arizona-Nevada), 10.5–4
Middle Atlantic States, 10.5–302
New England, 10.5–126
Ohio Valley, 10.5–298
South Atlantic Coast, 10.5–103
South Atlantic Coastal Waters, 10. 5–104
Alaska,
Cape Spencer Light, 10.5–243
College, 10E–74, 10E–101
Gulf of Alaska, 10.5–105
Arizona
Flagstaff, 10E–34
California
Los Angeles, 10.5–203, 10E–103
Pasadena, 10.5–193
Santa Barbara, 10.5–193
Sierra Nevada, 10.5–327
Colorado
Climax, 10E–127
District of Columbia (Washington), 10E–52, 10E–57
Kentucky
Louisville, 10.5–204
Massachusetts,
Harvard Forest (Central 10.5–129
Montana
Missoula, 10.5–193
New Mexico, 10E–47, 10E–75, 10E–141
White Sands, 10E–51, 10E–84, 10E–111
New York
New York City, 1
146
Ohio
Akron, 10E–120
Pennsylvania
Germantown, 10.5–8
Virginia
Fort Belvoir, 10.5–4
Washington
Puget Sound, 10.5–1
Carr Inlet, 10.5–1
Wisconsin
Univ. of Wisc. Arb
tum, 10.5–130
SOUTH AMERICA
Bolivia, 10.5–169
OCEANS, SEAS, AND ISLAND
Antarctica, 10.5–61, 10.5
Adélie Land, 10.5–60
Point Géologie, 10.5
Prince Harald Coast, 1
64
Arctic, 10.5–34, 10.5–57
North American Ar
10.5–135, 10.5–136
Spitsbergen
Kingsbay, 10E–16
Atlantic
Iceland, 10.5–35
Pacific
Northeastern Pacific, 1
105

LIST OF PERIODICALS

Note: This list contains the titles of the periodicals which regularly contain material on meteorology or related fields and it comprises only a small percentage of the periodicals from which pertinent articles are abstracted. The form of serial entry adopted by MAB is given in bold face type below.

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★ Indicates those periodicals which are primarily meteorological.

TABLE OF CONTENTS

Meteorological Abstracts and Bibliography, Volume 10, Number 5, May 1959

Foreword 5
Explanations 5

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

Major General Works 663
Collected Works 663
Textbooks and Technical Books 665
Monographs and Comprehensive Papers. 669
Popular Meteorology 672
Manuals and Glossaries 673
New Serials 674
Translations 675
General Geophysics and Meteorology 675
IGY 675
WMO 678
Arctic Research 678
Antarctic Research 679
Services and Societies 680
Conferences and Symposia 683
Education, History and Biography 684
Education and Research 684
History 686
Biography 687
Bibliography-Documentation-Terminology 688
Practical and Applied Meteorology 689
Oceanography and Marine Meteorology. 689
Geomagnetism 692
Astronautics—Satellite Observatories 692
Agricultural Meteorology 694
Aeronautical Meteorology 695
Glacier Ice and Sea Ice 697
Industrial Meteorology 700
Medical Meteorology 703
Forest Meteorology 696
Meteorological Observations and Instruments 704
Methods of Observation 704
Observational Data 706
Instrument Carriers 707
Instruments 707
Synoptic Analysis and Forecasting 709
Weather Control 713
Structure and Physics of the Atmosphere .. 716
Density and Composition of the Atmosphere 716
Atmospheric Pollution 716
Upper Atmosphere—Ionosphere 717
Radio Meteorology 72
Radioactivity 72
Mechanics and Thermodynamics of the Atmosphere 72
General Circulation 72
Atmospheric Disturbances 72
Radiation and Temperature 73
Radiation 73
Temperature 73
Upper Air Temperatures 73
Soil Temperature 73
Water Temperature 73
Pressure and Wind 73
Pressure 73
Wind 73
Gustiness and Turbulence 73
Wind Distribution and Wind Variations. 73
Vertical Distribution and Special Winds. 73
Wind Effects 73
Upper Air Winds 73
Vertical Motion 74
Aqueous Vapor, Hydrometeors and Hydrometeorology 74
Evaporation and Evapotranspiration 74
Condensation 74
Fog 74
Clouds 74
Precipitation 74
Rain, Snow and Hail 74
Hydrometeorology 74
Climatology and Bioclimatology 75
Climatology 75
Climate of Particular Places 75
Climatic Changes 75
Microclimatology 75
Climatic Classification 75
Bioclimatology 75
Upper Air Climatology 75
Environmental Influences 75
Miscellaneous 75
Cosmic Influences 75
Optical Phenomena 75
Electrical Phenomena 75
Auroras 75

PART II. ANNOTATED BIBLIOGRAPHY ON OZONE IN THE ATMOSPHERE (1858–1953)

Introduction 75
Outline of Contents 75

PART III. REVIEWS, TRANSLATIONS, RECENT MONOGRAPHS AND ANALYTICS FROM RECENT SERIALS AND COLLECTED WORKS

A. Reviews of Recent Important Meteorological Material 79
B. Translations and Recent Monographs 79
C. Meteorological Articles Appearing in Recently Issued Publications 79

PART IV. AUTHOR AND SUBJECT INDEXES

Index of Authors 81
Index of Subjects 81
Index of Geographical Locations 82

List of Periodicals ..... Cover